ORDER NO. ARD81100093C2-11

Service Manual

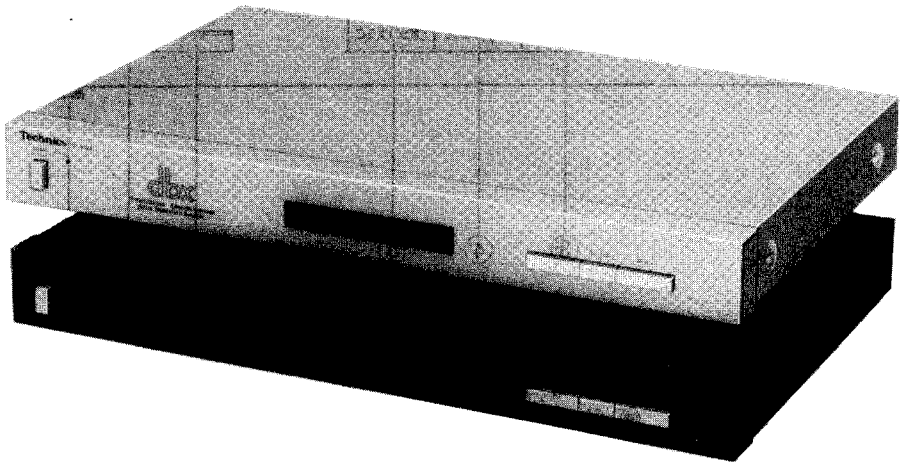
dbx Noise Reduction Unit

RP-9024

(Silver Face
Black Face)

dbx Noise Reduction Unit with
3-Head Deck Compatibility

This is the Service Manual for the following areas.
[D] ..... For all European areas.



Specifications

Dynamic range:	More than 110 dB (at 1 kHz, CrO_2 type tape)
Linearity:	10 dB or more improved (at 1 kHz, tape)
Noise level improvement:	More than 30 dB (tape)
Input level:	300 mV (standard), 6 V (max.)
Input impedance:	36 kΩ
Output level:	Max. 5.5 V, load impedance 22 kΩ
Output impedance:	2.5 kΩ
Frequency response:	40 – 20,000 Hz ±1 dB
Compression/expansion ratio:	2 : 1, 1 : 2 (constant linear decibel)
Power requirement:	110/125/220/240 V, 50-60 Hz
Power consumption:	8 W
Dimensions:	43.0 cm (W) × 5.3 cm (H) × 28.0 cm (D)
Weight:	3.0 kg

Specifications are subject to change without notice.
* The term dbx is registered trademark of dbx Inc.

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

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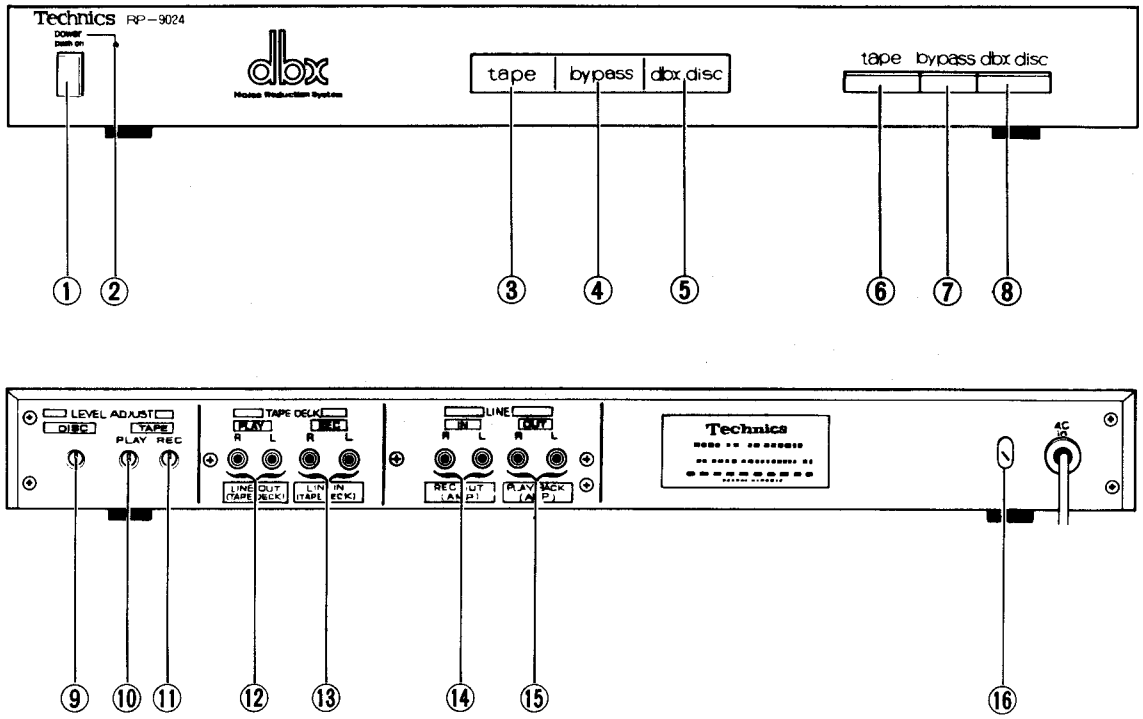
LOCATION OF CONTROLS AND COMPONENTS



① **Power switch [power (push on)]**

② **Power lamp**
Lights when Power switch is depressed.

③ **Tape lamp [tape]**
Lights up green when Tape button is depressed.

④ **Bypass lamp [bypass]**
Lights up yellow when Bypass button is depressed.

⑤ **dbx disc lamp [dbx disc]**
Lights up red wdhen dbx disc button is depressed.

⑥ **Tape button [tape]**
Depress this when playing back (decoding) a dbx-recorded tape or when recording (encoding).

⑦ **Bypass button [bypass]**
Depress this when recording or playing back without the dbx system.

⑧ **dbx disc button [dbx disc]**
Depress this when playing back (decoding) a dbx-encoded disc.

⑨ **Disc play level adjustor [LEVEL ADJUST • DISC]**
This adjusts the playback level of a dbx-encoded disc.

⑩ **Tape playback level adjustor [LEVEL ADJUST • TAPE PLAY]**
This adjusts the playback level of the dbx-recorded tape.

⑪ **Tape recording level adjustor [LEVEL ADJUST • TAPE REC]**
This adjusts the recording level of the dbx-encoded tape.

⑫ **Tape playback jacks [TAPE DECK • PLAY (R • L)]**
Connect the pin cord from the tape deck's LINE OUT (playback) jacks.

⑬ **Tape recording jacks [TAPE DECK • REC (R • L)]**
Connect the pin cord to the tape deck's LINE IN (recording) jacks.

⑭ **Line input jacks [LINE IN (R • L)]**
Connect the pin cord from the amplifier's REC OUT jacks.

⑮ **Line output jacks [LINE OUT (R • L)]**
Connect the pin cord to the amplifier's PLAYBACK jacks.

⑯ **Voltage selector**

DISASSEMBLY INSTRUCTIONS

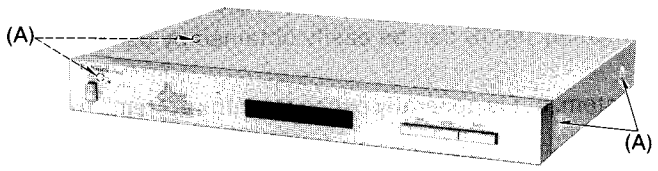


Fig. 1

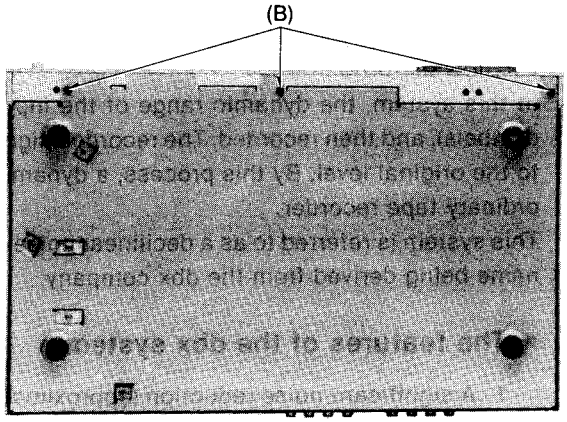


Fig. 2

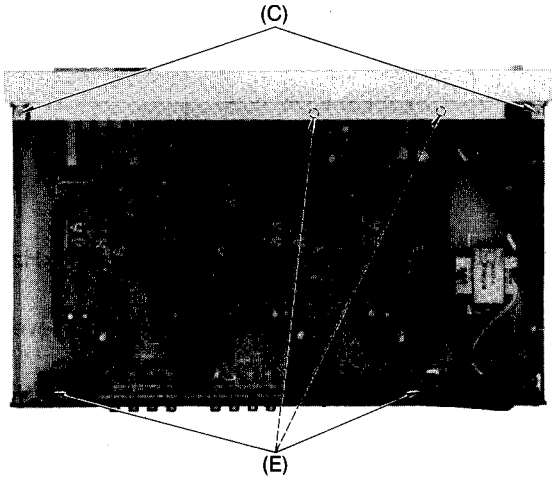


Fig. 3

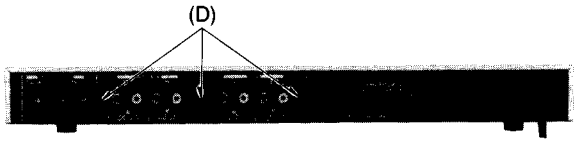


Fig. 4

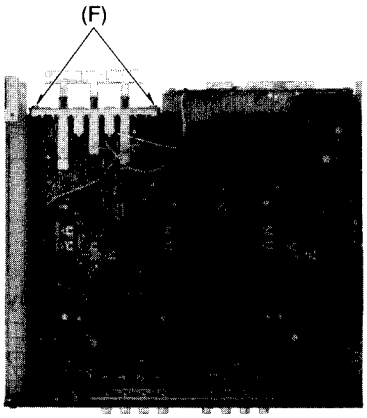


Fig. 5

Ref. No.	Procedure	To remove —— .	Remove —— .	Shown in fig. ——
1	1	Case cover	• 4 screws ····· (A)	1
2	1→2	Front panel	• 3 screws ····· (B) • 2 screws ····· (C)	2 3
3	1→2→3	Main circuit board	• 3 screws ····· (D) • 4 screws ····· (E) • 2 screws ····· (F)	4 3 5

OUTLINE OF dbx SYSTEM

In 1971, the dbx company of Massachusetts, U.S.A., succeeded in developing a logarithmic compression/expansion system for audio signals which extends across an extremely wide amplitude range and results in a very low distortion rate.
In this system, the dynamic range of the input signal is compressed to 1/2 its original level (measured in decibels), and then recorded. The recorded signal is then expanded (2x) prior to playback, in order to restore it to the original level. By this process, a dynamic range exceeding 100dB can be easily obtained by using an ordinary tape recorder.
This system is referred to as a decilinear noise reduction system, but is generally called the "dbx system", the name being derived from the dbx company.

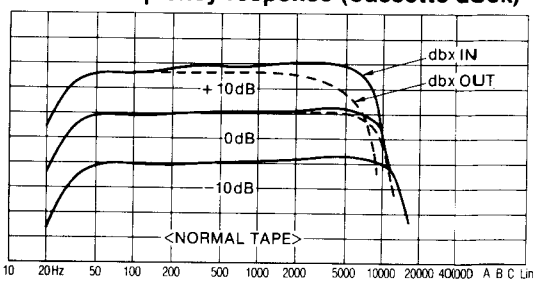
• The features of the dbx system

1. A significant noise reduction (approximately 30dB or more) is obtained over the entire audible frequency range.

Noise reduction mode	S/N ratio (Cassette deck)	Remarks
Noise reduction "OUT"	58dB	CrO_2 tape, peak level
dbx "IN"	92dB	CrO_2 tape, peak level

2. A great improvement in the dynamic range makes it possible to extend the range to 110dB (at 1kHz, CrO_2 tape).
3. The direct logarthmic method of compression and expansion protects against problems caused by level mismatching.
4. Even if phase distortion occurs in the signal transmission system, precise operation is maintained by means of the RMS level detector.
5. A low distortion rate is maintained throughout the frequency range.
   - Improvement of high frequency response. The dbx system solves the problem of deteriorated high frequency at higher input levels which is an inherent fault of cassette tape equipment. The response at approx. 8,000Hz at 10dB input is improved as much as 14dB. As a result, flatter response is obtained at both low and high input levels.

Overall frequency response (Cassette deck)

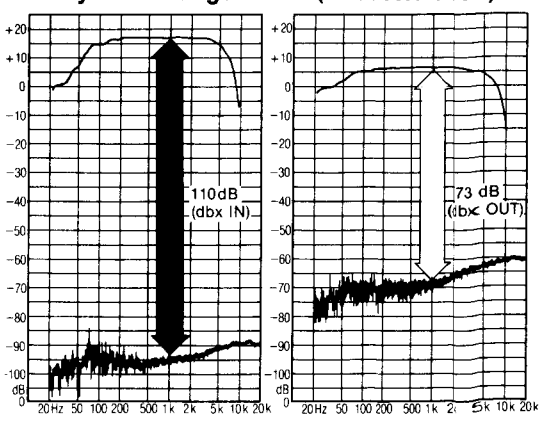


• Remarkable dynamic range of 110dB

About dynamic range:

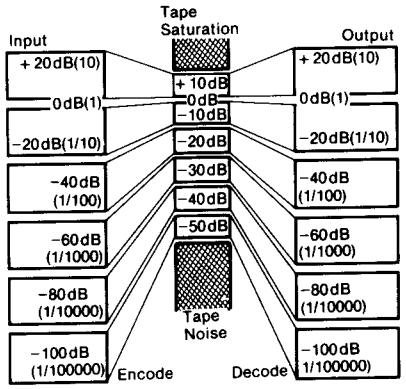
The dynamic range refers to the output range of an audio transmission system, extending from the lowest recognizable level to the highest possible level produced. Dynamic range is one of the values used to express the degree of fidelity of an audio transmission system.

Dynamic range: 1kHz (Cassette deck)

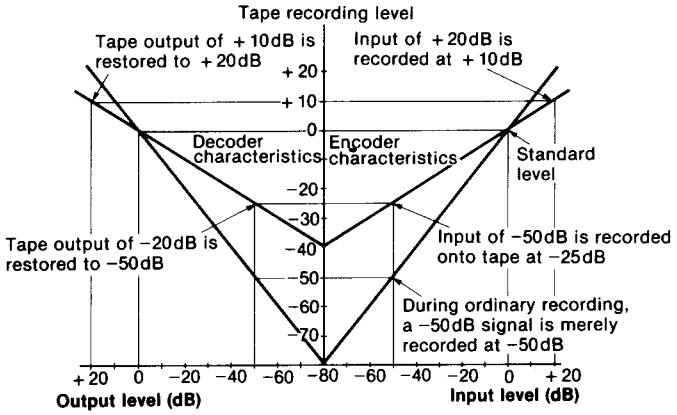


- **Compressing the dynamic range to 1/2 before recording, and then expanding it (by 2x) before playback produces the remarkable dynamic range of the dbx system.**
  - The dynamic range of cassette tape with a saturation level of +10dB and a noise level of −45dB (such as Technics CrO_2 position tape) is 55dB. Any sounds with a level greater than +10dB will result in considerable distortion, and any sounds less than −45dB will be inaudible due to the effect of noise, making high-fidelity reproduction impossible.
    The dbx system, however, linearly compresses the input level by a ratio of 1/2 in decibels prior to recording it onto the tape. A +20dB sound is thus compressed to +10dB, a −20dB sound is compressed to −10dB, and a −90dB sound is compressed to −45dB.
    As a result, a signal with a dynamic range extending from −90dB to +20dB (a 110dB dynamic range) can be contained within a range which extends from −45dB to +10dB (a 55dB dynamic range). Recording onto a cassette tape with a 55dB dynamic range is then possible.
    Prior to playback, the exact opposite process occurs and the sound levels are expanded. The +10dB sound is restored to its original level of +20dB, the −10dB sound is restored to −20dB, and the −45dB sound is restored to −90dB.
    Therefore, the basic principle of the dbx system, as described above, is to compress the 110dB dynamic range by 1/2 to 55dB prior to recording, and then the expand it (by 2x) prior to playback.

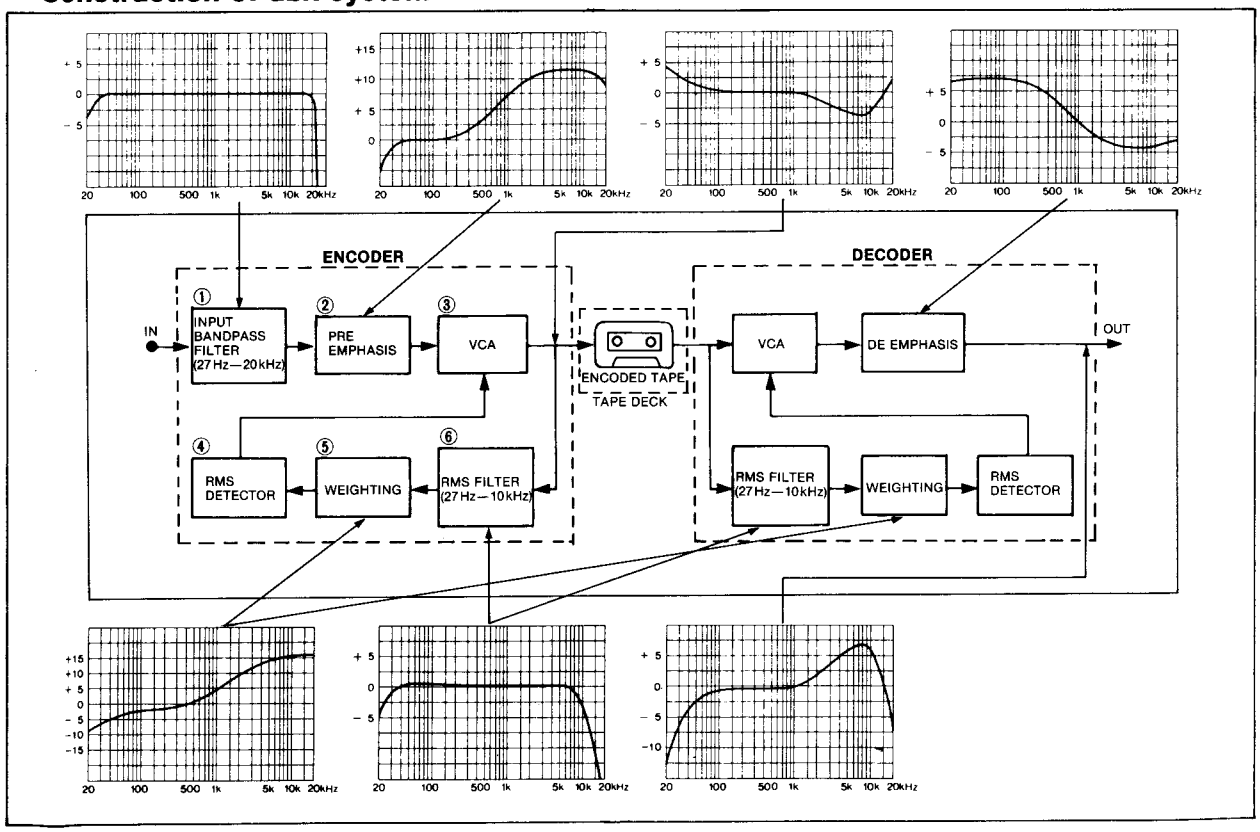
dbx system function diagram



Level compression/expansion diagram


Tape recording level
Tape output of +10dB is restored to +20dB
Input of +20dB is recorded at +10dB
Decoder characteristics
Encoder characteristics
Standard level
Tape output of −20dB is restored to −50dB
Input of −50dB is recorded onto tape at −25dB
During ordinary recording, a −50dB signal is merely recorded at −50dB
Output level (dB)
Input level (dB)

- **Construction of dbx system**



ENCODER

- The portion of the dbx system with compresses the volume level of the input signal by 1/2 (measured in decibels), before seding it to the recording system, is called the encoder.

① INPUT BANDPASS FILTER (27Hz—20kHz)

To prevent pulse noise or other types of interference from causing erroneous operation of the dbx system, all signals outside the 27Hz—20kHz audio band range are eliminated here.

② PRE-EMPHASIS

The high frequency range, where hiss noise is prominent, is emphasized here during recording. The end result is that, although the dbx system is effective in reducing noise across entire frequency band, noise in the high frequency range is reduced still more by this pre-emphasis circuitry.

③ VCA (voltage-controlled amplifier/attenuator)

This is an extremely important circuitry in the construction of the dbx system. In response to the incoming DC control voltage, the VCA varies the degree of amplification logarithmically in the same manner as the direct current, resulting in compression and expansion of the input signal's dynamic range.

④ RMS DETECTOR (RMS: root mean square)

This is an important element in the composition of the dbx system, because its circuitry generates a DC voltage (the voltage that controls the degree of amplification in the VCA) in proportion to the size of the input signal.
It does this by detecting the root mean square value of the input signal, and then converting it to a DC voltage in proportion to the logarithm of the detected level.
Erroneous operation due to phase shift is prevented by monitoring of the voltage level derived from the root mean square value.

⑤ WEIGHTING

To prevent the saturation level of the tape deck in high frequencies, this increases the RMS DETECTOR high frequency sensitivity and decreases the VCA high frequency gain. As a result, the linearity of the tape deck is enhanced in the high frequency range.

⑥ RMS FILTER (27Hz to 10kHz)

This filter cuts any signal other than 27Hz to 10Hz that mixes in input signals to prevent the RMS DETECTOR from malfunctioning. Those to be cut include an FM tuner STEREO PILOT signal, tape deck bias leakage and record player motor rotational noise. In addition, the signal in the frequency range (27Hz to 10kHz) passing through the BAND PASS FILTER is comparatively small in level variations when handled by the tape deck.
This ensures correct complementarity in the operation of the RMS DETECTOR and VCA during Encoding and Decoding.

DECODER

As shown in the diagram on the previous page, for playback output, the decoder expands the constantly changing level to double the decibel range.
For example, 2 −30dB signal is expanded to −60dB, and a level of −45dB becomes −90dB. On the other hand, a playback output +10dB is expanded to +20dB, and a saturation level signal is also correspondingly increased.
In terms of the system's operation, the decoder's function is the exact opposite of the function of the previously mentioned encoder.

When the DISC mode is selected, a 27Hz—20kHz band pass filter is also connected to the decoder.

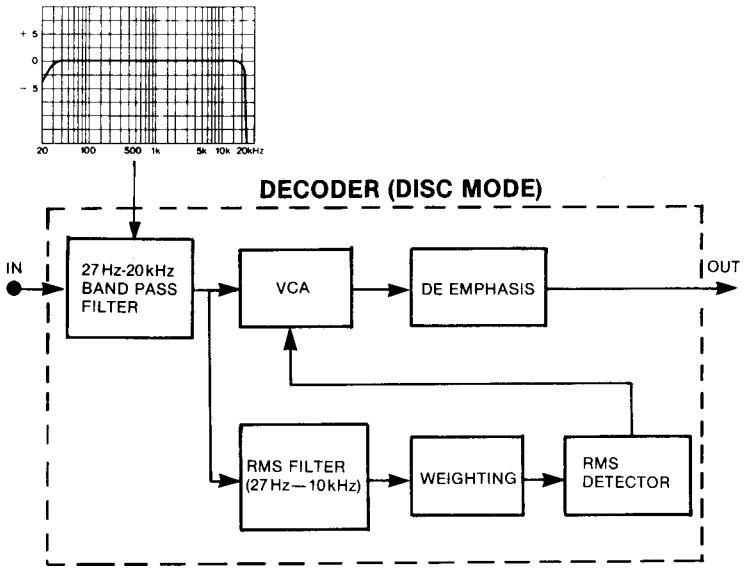
INPUT BAND PASS FILTER (DISC MODE)

All signals other than those on the audio band (27Hz—20kHz) are cuf off by this circuit in order to prevent faulty operation of VCA circuit due to signal interference (See Note 1) disturbing the input signal.

Note 1:

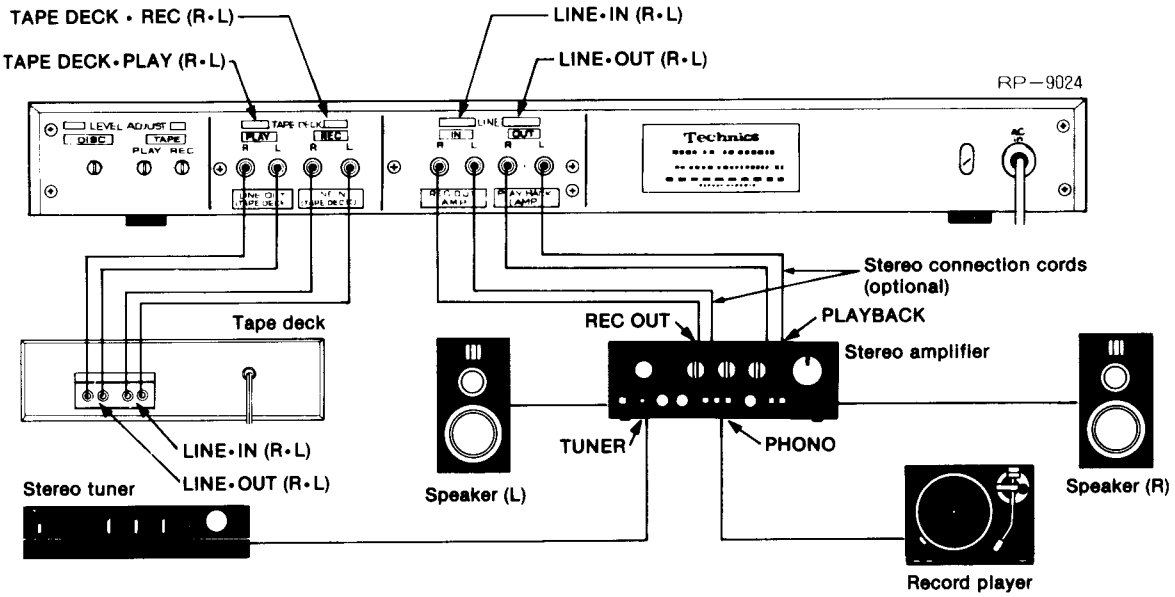
"Signal Interference" means:

- Record bias
- Noise due to warped disc
- Motor power transmitting noise of player



• CONNECTIONS AND PATH OF SIGNALS

• Connections

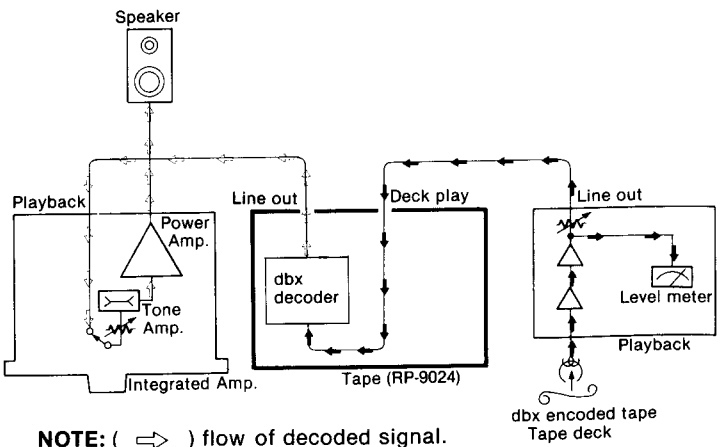


• dbx Playback

1. Depress the Tape button.
2. Set the amplifier's input selector to the tape position. (If the amplifier features a tape monitor switching function, set its tape monitor switch to the tape position.)
3. Load the dbx-recorded tape into the tape deck and play.
4. Set the volume to the suitable level using the amplifier's volume control.

* Keep the tape deck's Dolby NR switch at the "out", ("off") position.

• Path of signals



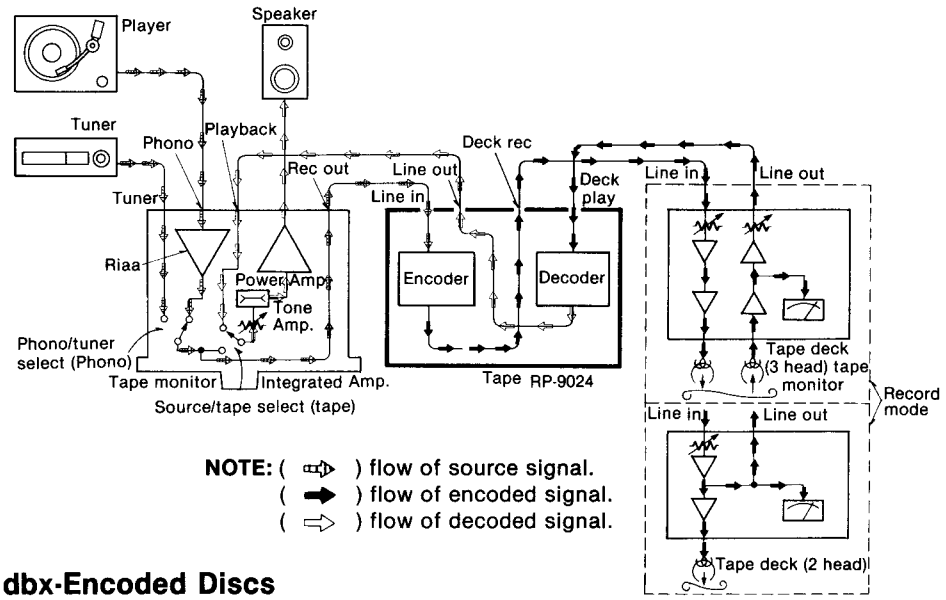
NOTE: (⇨) flow of decoded signal.
(➡) flow of encoded signal.

• dbx Recording

1. Depress the Tape button.
2. Play the source (FM broadcast, record, etc.) which is to be recorded.
3. Set the tape deck to the recording standby mode and adjust the recording level.
   Refer to the deck's operating instructions for details on adjusting the recording level.
   Remember when adjusting the recording level that it should be adjusted 2 or 3dB lower than usual since encoded signals are being supplied.
   Refer to the "Level Adjustments" on page 8 for ordinary cassette decks.

* Keep the tape deck's Dolby NR switch at the "out" ("off") position.

• Path of signals



NOTE: (⇨) flow of source signal.
(➡) flow of encoded signal.
(⇨) flow of decoded signal.

• Playing Back dbx-Encoded Discs

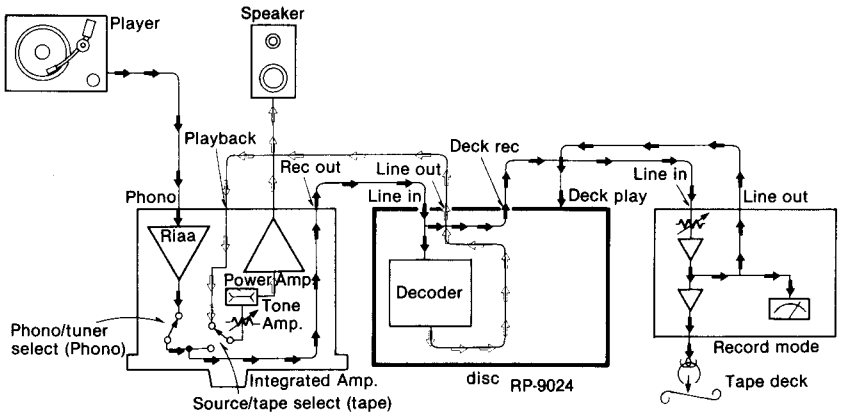
1. Depress the dbx disc button.
2. Set the amplifier's input selector to the tape position and the recording selector to the phono position. (If the amplifier features a tape monitor switching function, set its tape monitor switch to the tape position and its input selector to the phono position.)
3. Place the dbx-encoded disc on the turntable.

* Adjust the volume with the amplifier's volume control. The tape deck's volume, power and other controls have no effect.

• dbx Recording onto Tape While Playing dbx-Encoded Disc

1. Play the dbx-encoded disc (see previous section).
2. Set the tape deck to the recording standby mode and adjust the recording level (refer to step (3) in "dbx Recording").
3. When the pause is released, recording begins.

• Path of signals



NOTE: (➡) flow of encoded signal.
(⇨) flow of decoded signal.

LEVEL ADJUSTMENT

(Refer to [1], [2], [3].)

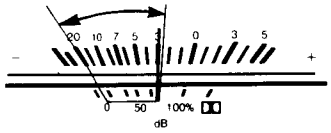
This unit's level is adjusted so that it is optimally allgned with the levels of the tape deck and amplifier. Make the following adjustments with an ordinary screwdriver so that the recording/playback level of the signals passing through the unit is virtually identical to the average level of the signals which do not pass through the unit.
These level adjustments are not regulated for dbx encoding and decoding operations and so, even if there is some slight deviation, this will not be sufficient to Impair operation.

• Tape Recording level

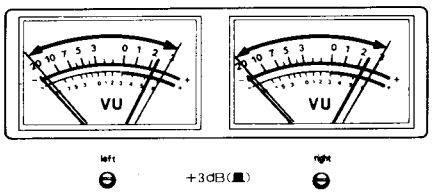
1. Supply the signals from the FM tuner or record player (used as the program source).
2. Depress the Bypass button.
3. Set the tape deck to the recording standby mode, and adjust the recording level with the input level adjustment knob.
   - Adjust so that the maximum deflection is around "−3dB" in the case of a VU meter or level meter ([1]).
   - Adjust so that the maximum deflection is "0"∼"+3dB" in the case of a VU meter on an open-reel deck ([2] Technics RS-1500U). The VU meters on the RS-1500U use a double scale. See the operating instructions for details.
   - Adjust so that the peak is around "+5dB" in the case of a fluorescent meter ([3] Technics RS-M280).
4. Depress the Tape button and use the rear panel tape recording level adjustor to set the volume and meter indication to the same value as when the signals are allowed to pass through the unit.

This completes the adjustment of the tape recording level. Recording may now start. Proceed with dbx recording for several minutes and use this tape to adjust the tape playback level.

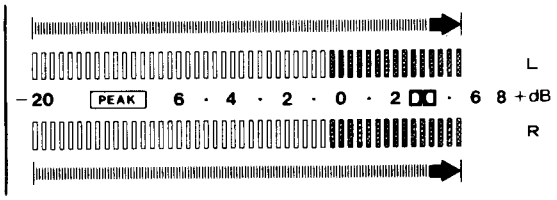
[1]



[2] Technics RS-1500U



[3] Technics RS-M280



• Tape Playback Level

1. Depress the Bypass button.
2. Set the amplifier's input selector to the tape position.
   If the amplifier has a tape monitor switching function, set the amplifier's tape monitor switch to the tape position.
3. Play back the dbx-recorded tape which has just been recorded.
4. Depress the Tape button and use the rear panel tape playback level adjustor to set the amplifier's volume and meter indication to the same value as when the signals are allowed to pass through the unit.

This completes the adjustment of the tape playback level.

• Disc Play Level

1. Set the amplifier's input selector to the phono position.
   If the amplifier has a tape monitor switching function, set the amplifier's tape monitor switch to source and its input selector to the phono position.
2. Play the dbx-encoded disc.
   The disc's encoded sound is heard directly.
3. Set the amplifier's input selector to the tape position.
   If the amplifier has a tape monitor switching function, set its tape monitor switch to the tape position.
4. Depress the dbx disc button and use the rear panel disc play level adjustor to set the amplifier's volume and meter indication to the same value as when the source sound was heard.

MEASUREMENT AND ADJUSTMENT METHOD

ADJUSTMENT PARTS LOCATION

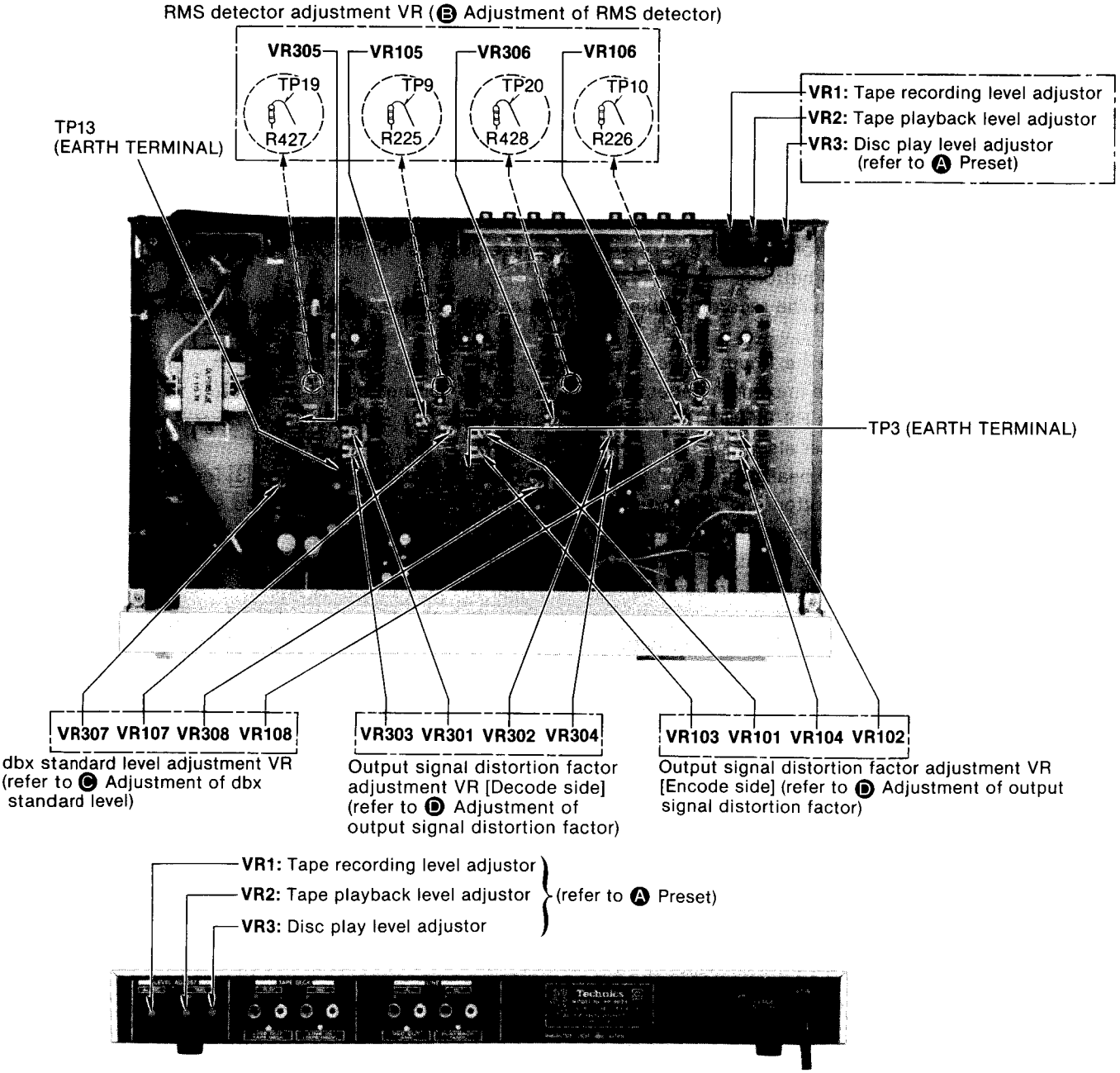
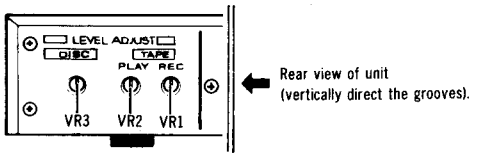
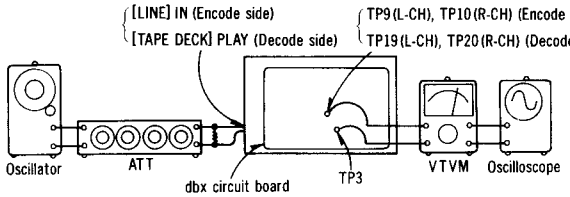
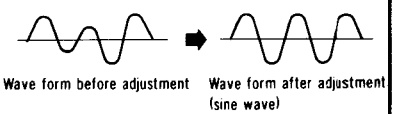
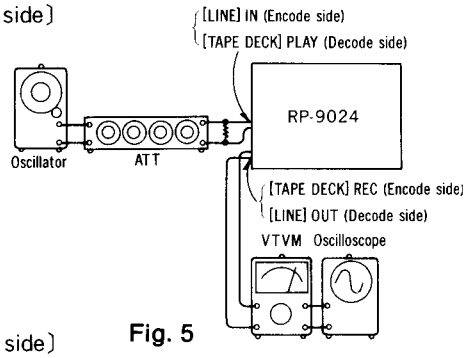


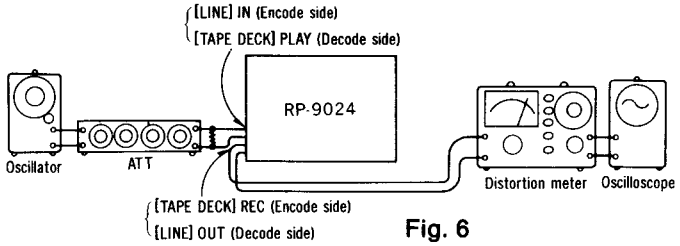
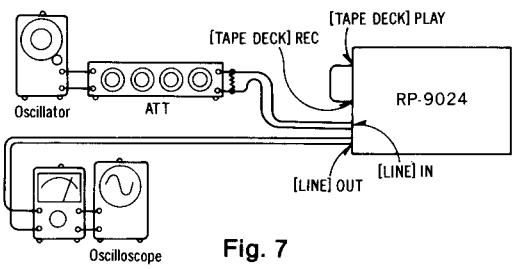
Fig. 1

NOTES: Set switches and controls in the following positions, unless otherwise specified.

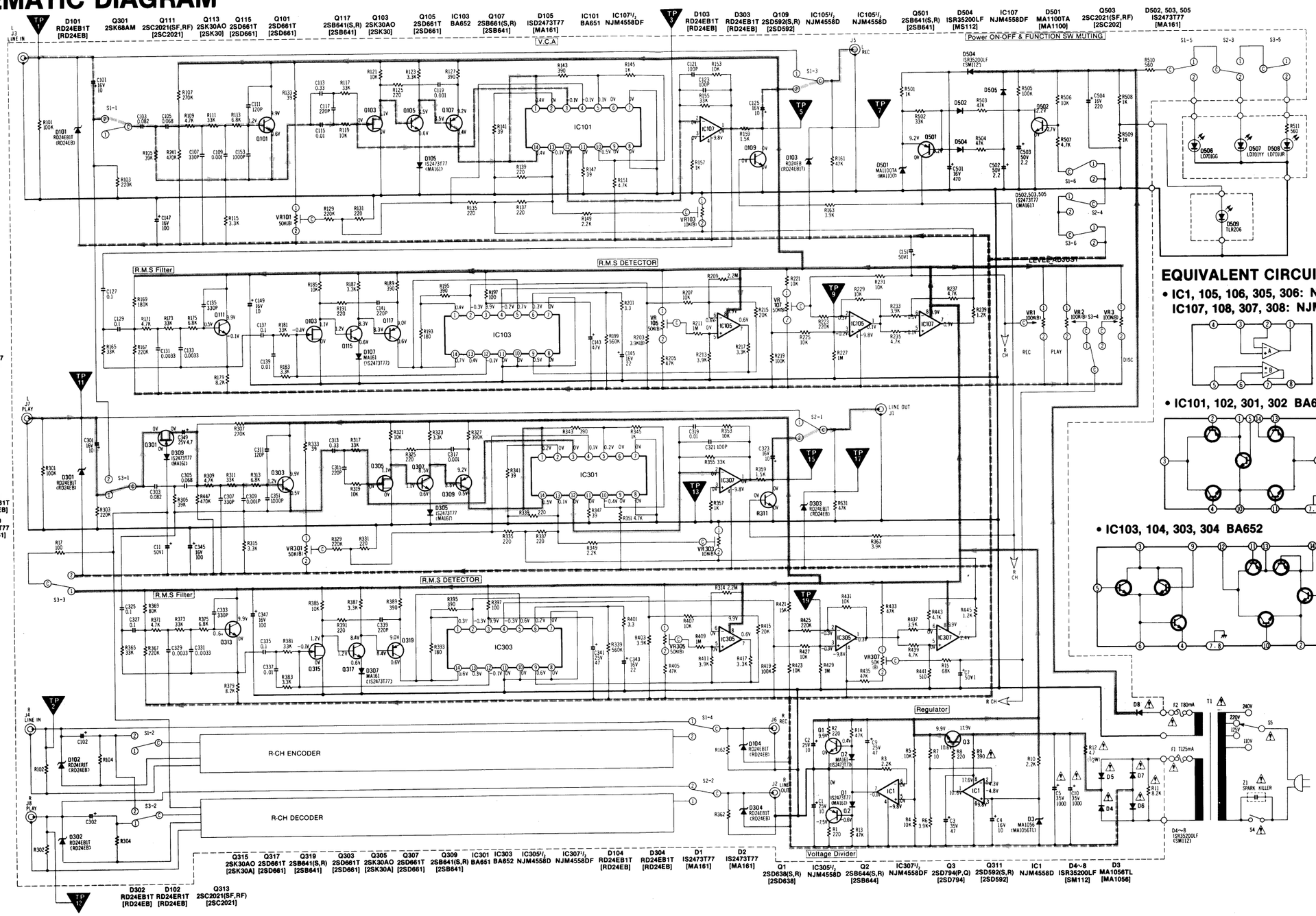
- Tape switch: ON
- Disc play level adjustor: Center
- Tape playback level adjustor: Center
- Tape recording level adjustor: Center

ITEM	MEASUREMENT & ADJUSTMENT
Ⓐ Pre-set	Set the semi-fixed variable resistors VR1, VR2 and VR3 (respectively for disc play level adjustor, tape playback level adjustor and tape recording level adjustor) to the center positions as shown below. NOTE: Be sure to perform this setting first.  **Fig. 2**

ITEM	MEASUREMENT & ADJUSTMENT
Ⓑ Adjustment of RMS detector Condition: * Tape mode Equipment: * VTVM * AF oscillator * ATT * Oscilloscope * Resistor (600Ω)	〔Encode side adjusting〕 1. Make the connections as shown in fig. 3, and push the tape button. 2. Apply 50Hz 300mV signal from [LINE] IN. 3. Make sure that the output signal at TP9 (L-CH) and TP10 (R-CH) (shown in fig. 1) is at 100Hz sine wave. If the output signal is not sinusoidal as shown in fig. 4, adjust VR105 (L-CH) and VR106 (R-CH) to make it sinusoidal.  Fig. 3  NOTE: The voltage of the output signal after adjustment is about 0.8 to 1.3mV rms. Fig. 4 〔Decode side adjusting〕 1. Make the connections as shown in fig. 3, and push the tape button. 2. Apply 50Hz 400mV signal from [TAPE DECK] PLAY. 3. Make sure that the output signal at TP19 (L-CH) and TP20 (R-CH) (shown in fig. 1) is at 100Hz sine wave. If the output signal is not sinusoidal as shown in fig. 4, adjust VR305 (L-CH) and VR306 (R-CH) to make it sinusoidal.
Ⓒ Adjustment of dbx standard level Condition: * Tape mode Equipment: * VTVM * AF oscillator * ATT * Oscilloscope * Resistor (600Ω)	〔Standard level adjustment in dbx Encode side〕 1. Make the connections as shown in fig. 5 and apply 1kHz 300mV signal from [LINE] IN, and push the tape button. 2. Make sure that the output level at [TAPE DECK] REC is within 300mV ±1dB. If the output level is not within standard, adjust VR107 (L-CH), VR108 (R-CH) (fig. 1) to make it within standard. Standard value: 300mV±1dB  Fig. 5 〔Standard level adjustment in dbx Decode side〕 1. Make the connections as shown in fig. 5 and apply 1kHz 400mV signal from [TAPE DECK] PLAY and perform the following adjustments. 2. Make sure that the output level at [LINE] OUT is within 400mV±1dB. If the output level is not within standard, adjust VR307 (L-CH), VR308 (R-CH) (fig. 1) to make it within standard. Standard value: 400mV±1dB
Ⓓ Adjustment of output signal distortion factor Condition: * Tape mode Equipment: * VTVM * AF oscillator * ATT * Oscilloscope * Resistor (600Ω) * Distortion meter	〔Check for output signal distortion factor in dbx Encode side〕 1. Make the connections as shown in fig. 6. 2. Push the tape button. 3. Adjust ATT so that the signal level at [LINE] IN is 300mV. 4. Measure the distortion factor of output signal at [TAPE DECK] REC and make sure that the distortion factor is less than 0.15%. 5. If measured value is not standard, adjust as follows: Standard value: Less than 0.15%

ITEM	MEASUREMENT & ADJUSTMENT
	〔Encode side adjusting〕 1. Make the connections as shown in fig. 6 and apply 1 kHz 300 mV (0 dB) signal from [LINE] IN, and perform the following adjustments. 2. Push the tape button, and adjust ATT so that the signal level at [LINE] IN becomes 300 mV − 3 dB. 3. Adjust VR101 (L-CH) and VR102 (R-CH) so that output signal distortion at [TAPE DECK] REC is minimized. 4. Adjust ATT so that the signal level at [LINE] IN becomes 300 mV + 2 dB. 5. Adjust VR103 (L-CH) and VR104 (R-CH) so that output signal distortion at [TAPE DECK] REC is minimized. 6. Repeat adjustments 2 through 5 until the distortion factor is minimized. 7. Check the distortion factor in dbx Encode side.  **Fig. 6** **〔Check for output signal distortion factor in dbx Decode side〕** 1. Make the connections as shown in fig. 6 and apply 1 kHz 400 mV signal from [TAPE DECK] PLAY, and check as follows: 2. Push the tape button. 3. Measure the distortion factor of output signal at [LINE] OUT, and make sure that the distortion factor is less than 0.15%. 4. If measured value is not standard, adjust as follows: **Standard value: Less than 0.15%** **〔Decode side adjusting〕** 1. Make the connections as shown in fig. 6 and apply 1 kHz 400 mV (0 dB) signal from [TAPE DECK] PLAY, and perform the following adjustments. 2. Push the tape button, and adjust ATT so that the signal level at [TAPE DECK] PLAY becomes 400 mV − 3 dB. 3. Adjust VR301 (L-CH) and VR302 (R-CH) so that output signal distortion at [LINE] OUT is minimized. 4. Adjust ATT so that the signal level at [TAPE DECK] PLAY becomes 400 mV + 2 dB. 5. Adjust VR303 (L-CH) and VR304 (R-CH) so that output signal distortion at [LINE] OUT is minimized. 6. Repeat adjustments 2 through 5 until the distortion factor is minimized. 7. Check the distortion factor in dbx Decode side.
Ⓔ Function check	Recheck the Ⓑ, Ⓒ, and Ⓓ measurement/adjustment results, and set the dbx standard level and signal distortion factor to their standard values.
Ⓕ Check for frequency response (Back to back) Condition: * Tape mode Equipment: * VTVM * AF oscillator * ATT * Oscilloscope * Resistor (600 Ω)	1. Make the connections as shown in fig. 7 and apply 1 kHz 400 mV signal from [LINE] IN, and check as follows: 2. With the signal level at [LINE] OUT as 0 dB, change the signal frequency to 100 Hz, 20 Hz, 1 kHz and 15 kHz respectively. Read signal levels at [LINE] OUT and check that they are within the specifications.  **Fig. 7** **Specifications** Frequency / Signal levels at [LINE] OUT 1 kHz: 0 dB 100 Hz: 0 dB ± 1 dB 20 Hz: −9 dB ± 3 dB 15 kHz: +1.5 dB ± 1.5 dB

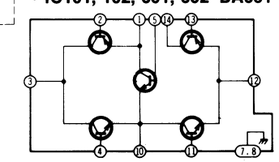
SCHEMATIC DIAGRAM



EQUIVALENT CIRCUIT

- IC1, 105, 106, 305, 306: NJM4558D
  IC107, 108, 307, 308: NJM4558DF

- IC101, 102, 301, 302 BA651

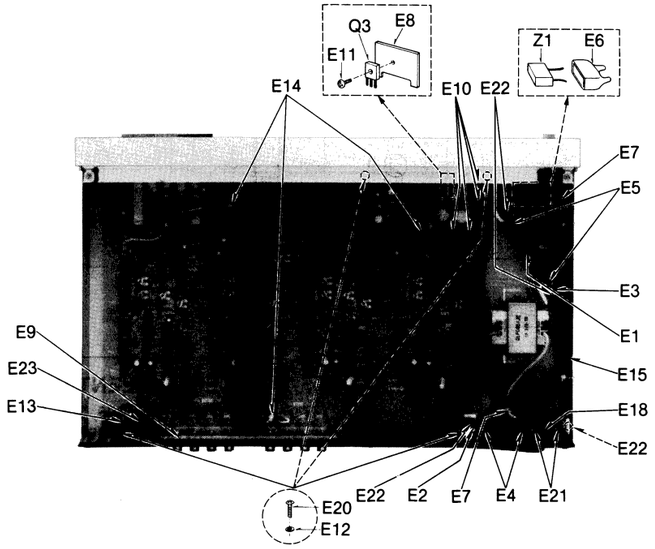


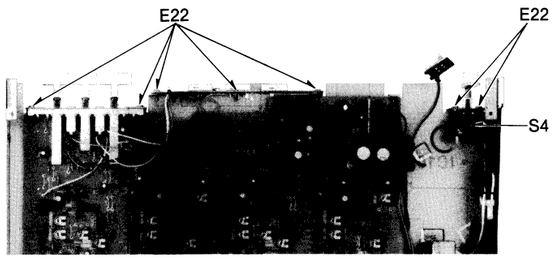
- IC103, 104, 303, 304 BA652

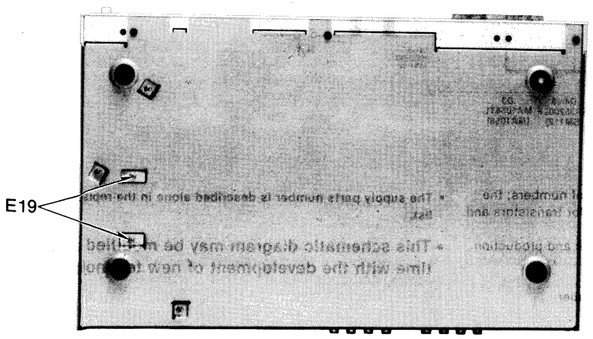
NOTES:

- S1-1—S1-6 .....Tape switch (shown in OFF position).
- S2-1—S2-4 .....Bypass switch (shown in ON position).
- S3-1—S3-6 .....Disc switch (shown in OFF position).
- S4.....Power ON/OFF switch.
- S5.....AC power voltage select switch.
- VR1 .....Tape recording level adjustment VR.
- VR2 .....Tape playback level adjustment VR.
- VR3 .....Disc play level adjustment VR.
- VR101—104 ...Output signal distortion factor adjustment VR [Encode side].
- VR105, 106 .....RMS detector adjustment VR [Encode side].
- VR107, 108 .....dbx standard output level adjustment VR [Encode side].
- VR301—304 ...Output signal distortion factor adjustment VR [Decode side].
- VR305, 306 .....RMS detector adjustment VR [Decode side].
- VR307, 308 .....dbx standard output level adjustment VR [Decode side].
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
  1K = 1,000Ω, 1M = 1,000KΩ
- Capacity are in microfarads (μF) unless specified otherwise.
  P = Pico-farads.
- All voltage values shown in circuitry are under no signal condition bypass mode.
  For measurement, use VTVM.
- ( ) this arrow indicates the flow of the decoding signal.
- ( ) this arrow indicates the flow of the encoding signal.
- ( ) this arrow indicates (B+).
- ( ) this arrow indicates (B−).
- Important safety notice
  Components identified by △ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors and diodes.
  One type of number is used for supply parts number and production parts number when they are identical.
  e.g. Q1
  {2SC2021(RF,SF) ← Production parts number
  {[2SC2021SF] ← Supply parts number
  D2
  {QVD1S2473T ← Production parts number
  {[MA161] ← Supply parts number
- **The supply parts number is described alone in the replacement parts list.**
- **This schematic diagram may be modified at any time with the development of new technology.**

ELECTRICAL PARTS LOCATION





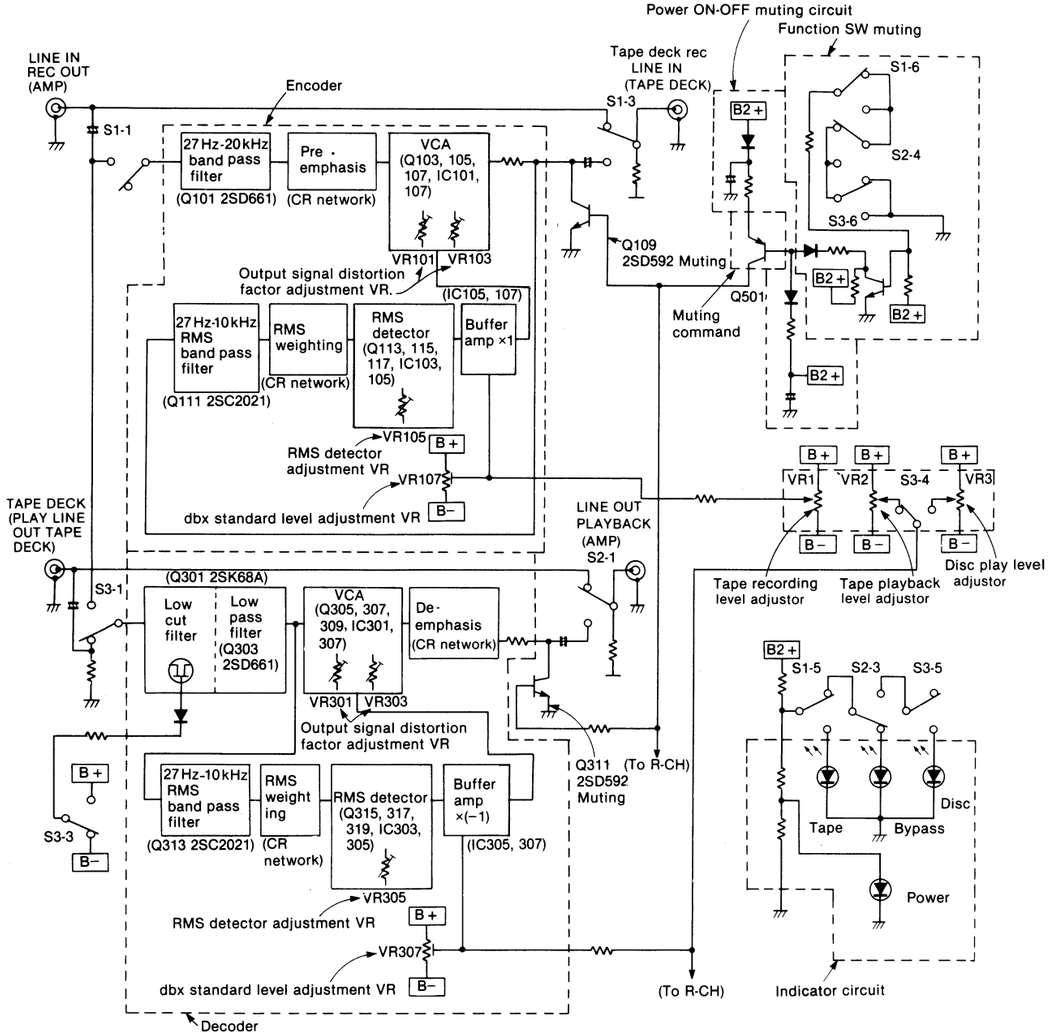


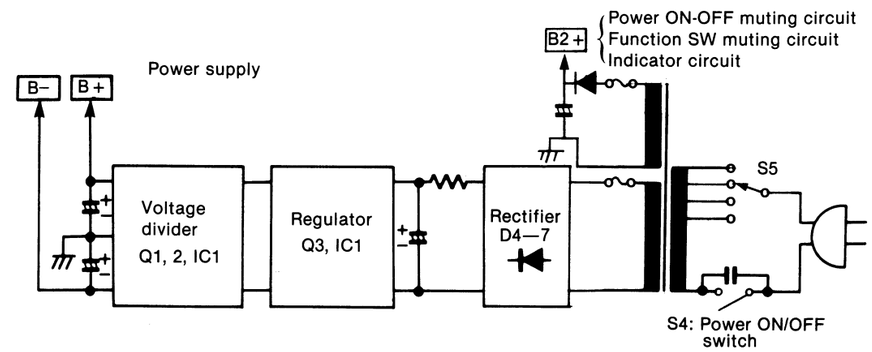
REPLACEMENT PARTS LIST

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

Ref No.		Part No.	Part Name & Description
		ELECTRICAL PARTS	
E1		QJT4017	4 Pin Terminal
E2		QNAN0146	Switch Angle
E3		QMAM0147	4 Pin Terminal Angle
E4		XTN3+6B	Tapping Screw ⊕3×6
E5		XTN3+10B	Tapping Screw ⊕3×10
E6		QTW1195	Spark Killer Cover
E7		QTD1181	Wire Clamper
E8		QTHM0011	Heat Sink
E9		QMAM0140	Jack Board Angle
E10	⚠	QTF1054	Fuse Holder
E11		XTN3+8B	TappingScrew ⊕3×8
E12		XWG3	Washer
E13		QTD1001	Lug Terminal
E14		QTD1181	Nylon Clamper
E15	⚠	RJA88	AC Power Cord
E17		QBJ1425	Cord Bushing
E18		QTD1164	Cord Bushing
E19		XSN3+8S	Screw
E20		XTN3+8B	Tapping Screw
E21		XSN3+20S	Screw ⊕3×20
E22		XTB3+8B	Tapping Screw ⊕3×8
E23		QKJM0066	Volume Angle

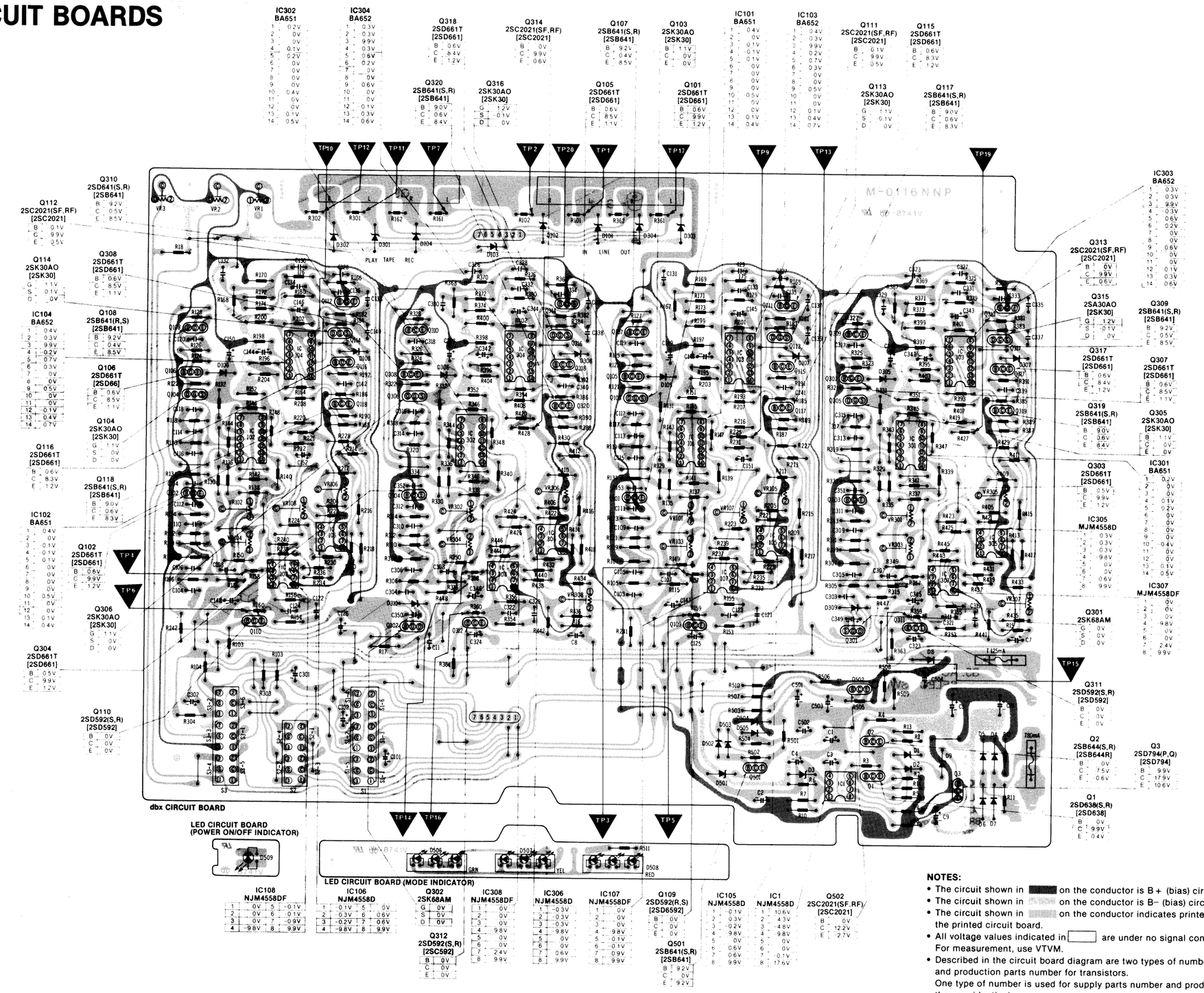
BLOCK DIAGRAM (L-CH ONLY)





NOTE: • S1.....TAPE switch
• S2.....BYPASS switch
• S3.....DISC switch
} These three interlocked switches are used to select TAPE/BYPASS/DISC mode. (BYPASS mode is selected in case of the above figure.)

CIRCUIT BOARDS



NOTES:

- The circuit shown in ■ on the conductor is B+ (bias) circuit.
- The circuit shown in ■ on the conductor is B– (bias) circuit.
- The circuit shown in ■ on the conductor indicates printed circuit on the back side of the printed circuit board.
- All voltage values indicated in ☐ are under no signal condition and bypass mode. For measurement, use VTVM.
- Described in the circuit board diagram are two types of numbers; the supply parts number and production parts number for transistors.
  One type of number is used for supply parts number and production parts number when they are identical.
  e.g. Q601
  {2SA1037(R,Q,S)← **Production parts number**
  {[2SA1037R]← **Supply parts number**
- **The supply parts number is described alone in the replacement parts list.**

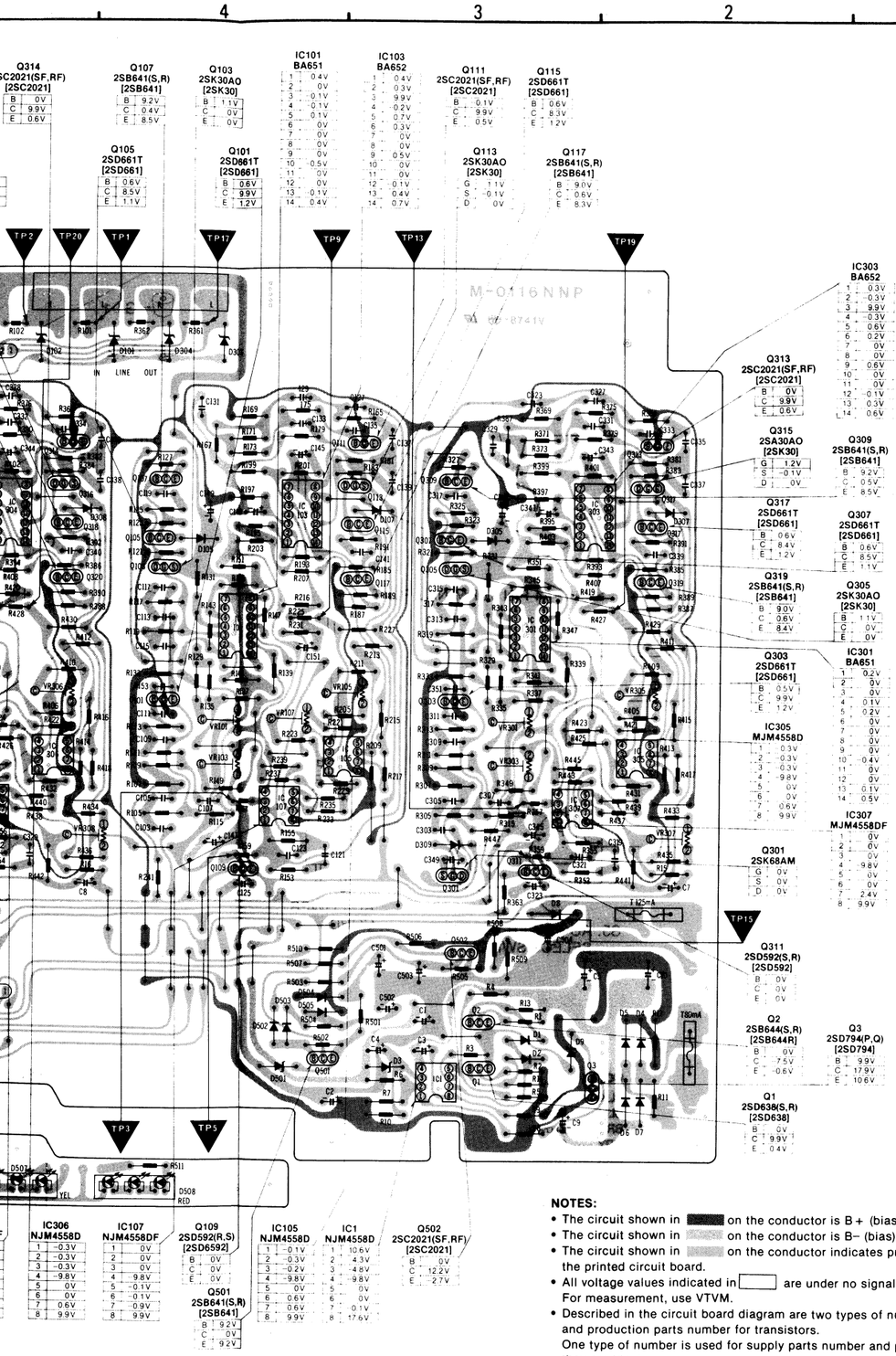
- **This circuit board diagram may be modified at any time with the development of new technology.**

NOTES: RESIS
ERQ
ERQ
ERS
ERQ
ERX
ERQ
ERQ
ERF

REP
Impo
Comp
When

TERMINATIONS

IC1, 105~108 305, 308	IC101~104 301~304
Q1, 2, 101, 102, 105~108, 111, 112, 115~118, 303, 304, 307~310, 314, 315, 317~320, 501, 502	Q3
Q103, 104, 113, 114, 305, 306, 315, 316	Q109, 110, 311 312
Q301, 302	D1, 2, 105~108 305~310, 502 503, 505
D3	D4~8, 504
D101~104, 301~304	D501
D506~506	D509



NOTES:

- The circuit shown in ■ on the conductor is B+ (bias) circuit.
- The circuit shown in ■ on the conductor is B− (bias) circuit.
- The circuit shown in ■ on the conductor indicates printed circuit on the back side of the printed circuit board.
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  One type of number is used for supply parts number and production parts number when they are identical.
  e.g. Q601
  {2SA1037(R,Q,S)◄—Production parts number
  {[2SA1037R]◄—Supply parts number
- **The supply parts number is described alone in the replacement parts list.**

- **This circuit board diagram may be modified at any time with the development of new technology.**

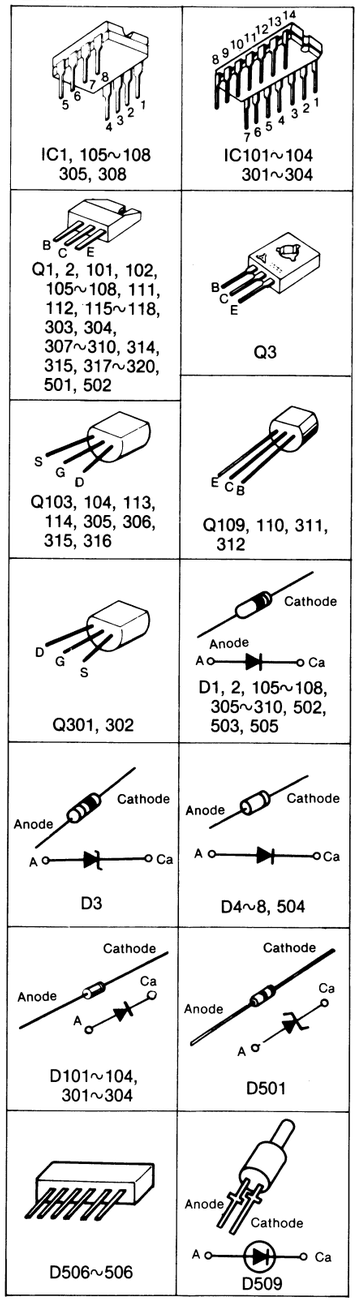
NOTES: RESISTORS
ERD ...Carbon
ERG ...Metal-oxide
ERS ...Metal-oxide
ERO ...Metal-film
ERX ...Metal-film
ERQ ...Fuse type metallic
ERC ...Solid
ERF ...Cement

CAPACITORS
ECBA .....Ceramic
ECGQ .....Ceramic
ECKQ .....Ceramic
ECCQ .....Ceramic
ECFQ .....Ceramic
ECQM .....Polyester film
ECQE .....Polyester film
ECQF .....Polypropylene
ECEQ .....Electrolytic
ECEQN ...Non polar electrolytic
ECQS .....Polystyrene
ECSQ .....Tantalum
QCS .....Tantalum

REPLACEMENT PARTS LIST

Important safety notice
Components identified by △ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

TERMINATIONS



Ref No.	Part No.
RESISTORS	
R1, 2	ERD25FJ221
R3	ERD25FJ222
R4, 5	ERD25FJ103
R6	ERO25CKG3901
R7	ERO25CKF1002
R8	ERD25FJ221
R9 △	ERD2FCG391P
R10	ERD25FJ222
R11 △	ERD25FJ822
R12 △	ERD50FJ4R7P
R13, 14	ERD25TJ473
R15, 16	ERD25TJ683
R17	ERD25FJ101
R18	ERD25TJ273
R101, 102	ERD25TJ104
R103, 104	ERD25TJ224
R105, 106	ERD25TJ393
R107	ERD25TJ224
R108	ERD25TJ334
R109, 110	ERD25FJ472
R111, 112	ERD25TJ333
R113, 114	ERD25FJ682
R115, 116	ERD25FJ332
R117, 118	ERD25TJ333
R119, 120, 121, 122	ERD25FJ103
R123, 124	ERD25FJ332
R125, 126	ERD25FJ221
R127, 128	ERD25FJ391
R129, 130	ERD25TJ224
R131, 132	ERO25CKG2200
R133, 134	ERD25FJ390
R135, 136, 137, 138, 139, 140	ERO25CKG2200
R141, 142	ERD25FJ390
R143, 144	ERD25FJ391
R145, 146	ERD25FJ102
R147, 148	ERD25FJ390
R149, 150	ERD25FJ222
R151, 152	ERD25FJ472
R153, 154	ERD25FJ103
R155, 156	ERO25CKF3302
R157, 158	ERD25TJ102
R159, 160	ERD25TJ152
R161, 162	ERD25TJ473
R163, 164	ERD25FJ392
R165, 166	ERD25TJ333
R167, 168	ERD25TJ224
R169, 170	ERD25TJ184
R171, 172	ERD25FJ472
R173, 174	ERD25TJ333
R175, 176	ERD25FJ682
R179, 180	ERD25FJ822
R181, 182	ERD25TJ333
R183, 184	ERD25FJ332
R185, 186	ERD25FJ103
R187, 188	ERD25FJ332
R189, 190	ERD25FJ391
R191, 192	ERD25FJ221
R193, 194	ÆRD25FJ181
R195, 196	ERD25FJ391
R197, 198	ERD25FJ101
R199, 200	ERD25TJ564
R201, 202	ERO25FJ3R3
R203, 204	ERD25FJ392
R205, 206	ERD25TJ473
R207, 208	ERO25CKF1002
R209, 210	ERD25TJ225
R211, 212	ERD25TJ105
R213, 214	ERD25FJ392
R215, 216	ERO25CKF2002
R217, 218	ERD25FJ332
R219, 220	ERD25TJ104
R221, 222	ERD25FJ103
R223, 224	ERD25TJ224
R225, 226	ERD25TJ103
R227, 228	ERD25TJ105
R229, 230, 231, 232	ERD25FJ103
R233, 234	ERO25CKG3901
R235, 236, 237, 238	ERO25CKG4701
R239, 240	ERD25FJ122
R241, 242	ERD25TJ474
R301, 302	ERD25TJ104
R303, 304	ERD25TJ224
R305, 306	ERD25TJ393
R307, 308	ERD25TJ334
R309, 310	ERD25FJ472
R311, 312	ERD25TJ333
R313, 314	ERD25FJ682
R315, 316	ERD25FJ332
R317, 318	ERD25TJ333
R319, 320, 321, 322	ERD25FJ103
R323, 324	ERD25FJ332
R325, 326	ERD25FJ221
R327, 328	ERD25FJ391
R329, 330	ERD25TJ224
R331, 332	ERO25CKG2200
R333, 334	ERD25FJ390
R335, 336, 337, 338, 339, 340	ERO25CKG2200
R341, 342	ERD25FJ390
R343, 344	ERD25FJ391
R345, 346	ERD25FJ102
R347, 348	ERD25FJ390
R349, 350	ERD25FJ222
R351, 352	ERD25FJ472
R353, 354	ERD25FJ103
R355, 356	ERO25CKF3302
R357, 358	ERD25TJ102
R359, 360	ERD25TJ152
R361, 362	ERD25TJ473
R363, 364	ERD25FJ392
R365, 366	ERD25TJ333
R367, 368	ERD25TJ224
R369, 370	ERD25TJ184
R371, 372	ERD25FJ472
R373, 374	ERD25TJ333
R375, 376	ERD25FJ682
R379, 380	ERD25FJ822
R381, 382	ERD25TJ333
R383, 384	ERD25FJ332
R385, 386	ERD25FJ103
R387, 388	ERD25FJ332
R389, 390	ERD25FJ391
R391, 392	ERD25FJ221
R393	ERD25FJ181
R394	ERD25FH181
R395, 396	ERD25FJ391
R397	ERD25FJ101
R399, 400	ERD25TJ564
R401, 402	ERO25FJ3R3
R403, 404	ERD25FJ392
R405, 406	ERD25TJ473
R407, 408	ERO25CKF1002
R409, 410	ERD25TJ105
R411, 412	ERD25FJ392
R413, 414	ERD25TJ225
R415, 416	ERO25CKF2002
R417, 418	ERD25FJ332
R419, 420	ERD25TJ104
R421, 422	ERD25TJ153
R423, 424	ERD25FJ103
R425, 426	ERD25TJ224
R427, 428	ERD25TJ103
R429, 430	ERD25TJ105
R431, 432	ERD25FJ103
R433, 434, 435, 436	ERD25TJ473
R437, 438	ERO25CKG3901
R439, 440	ERO25CKG4701
R441, 442	ERO25CKG5100
R443, 444	ERO25CKG4701
R445, 446	ERD25FJ122
R447, 448	ERD25TJ474
R501	ERD25FJ102
R502	ERD25TJ333
R503, 504	ERD25TJ473
R505	ERD25TJ104
R506	ERD25FJ103
R507	ERD25FJ472
R508, 509	ERD25FJ102
R510, 511	ERD25FJ561

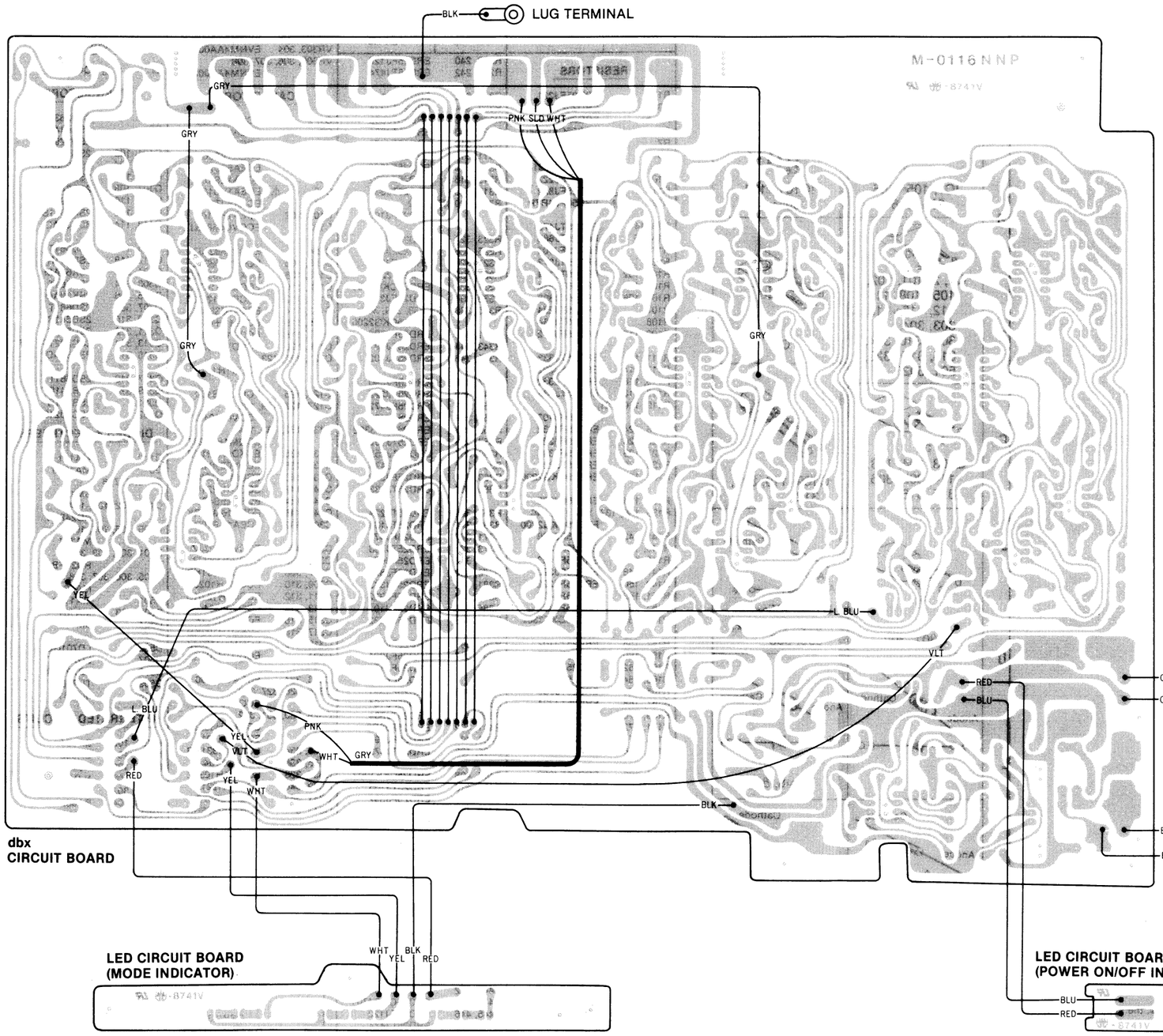
Ref No.	Part No.
VARIABLE RESISTORS	
VR1, 2, 3	QVMH0GS07B15
VR101, 102	EVNM4AA00B54
VR103, 104	EVNM4AA00B14
VR105, 106, 107, 108	EVNM4AA00B54
VR301, 302	EVNM4AA00B54
VR303, 304	EVNM4AA00B14
VR305, 306, 307, 308	EVNM4AA00B54
CAPACITORS	
C1, 2	ECEA1HS100
C3	ECEA1HS470
C4	ECEA1HS100
C5 △	ECEA1VS102
C7, 8	ECEA50Z1
C9	ECEA1ES470
C10 △	ECEA1VS102
C11	ECEA50Z1
C101, 102	ECEA1HS100
C103	ECQV05823JZ
C104	ECQV05823JZ
C105, 106	ECQV05683JZ
C107, 108	ECKD1H331KB
C109, 110	ECQM1H102JZ
C111, 112	ECCD1H121KC
C113, 114	ECQV05334JZ
C115, 116	ECQM1H103JZ
C117, 118	ECCD1H221K
C119, 120	ECKD1H102KB
C121, 122, 123, 124	ECCD1H101K
C125, 126	ECEA1HS100
C127, 128, 129, 130	ECQV05104JZ
C131, 132, 133, 134	ECQM1H332JZ
C135, 136	ECKD1H331KB
C137, 138	ECQV05104JZ
C139, 140	ECQM1H103JZ
C141, 142	ECCD1H221K
C143, 144	ECEA1ES470
C145, 146	ECEA16M22RK
C301, 302	ECEA1HS100
C303, 304	ECQV05823JZ
C305, 306	ECQV05683JZ
C307, 308	ECKD1H331KB
C309, 310	ECQM1H102JZ
C311, 312	ECCD1H121KC
C313, 314	ECQV05334JZ
C315, 316	ECCD1H221K
C317, 318	ECKD1H102KB
C319, 320	ECQM1H103JZ
C321	ECCD1H101K
C323, 324	ECEA1HS100
C325, 326, 327, 328	ECQV05104JZ
C329, 330, 331, 332	ECQM1H332JZ
C332	ECCD1H101K
C333, 334	ECKD1H331KB
C335, 336	ECQV05104JZ
C337, 338	ECQM1H103JZ
C339, 340	ECCD1H221K
C341, 342	ECEA1ES470
C343, 344	ECEA16M22RK

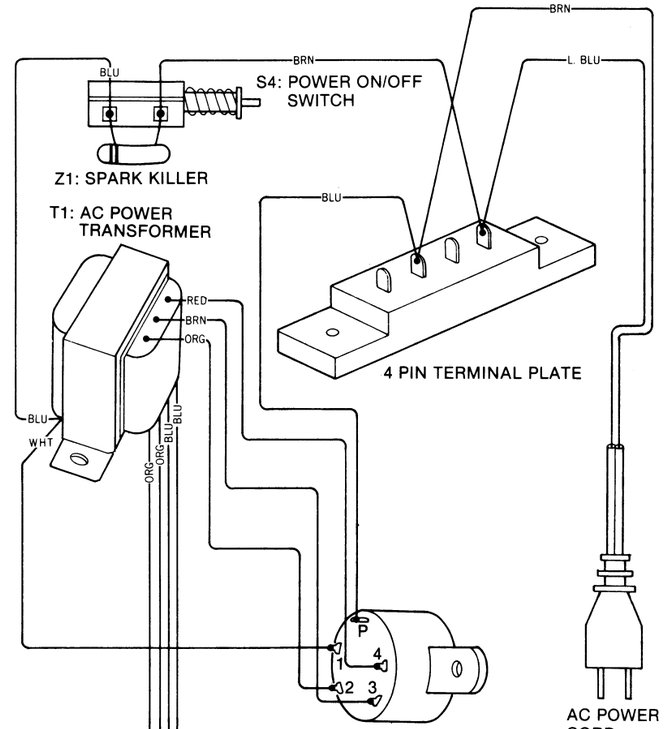
Ref No.	Part No.
C345, 346, 347, 348	ECEA1ES101
C349, 350	ECEA1ES4R7
C351, 352	ECKD1H102KB
C501	ECEA1ES471
C502, 503	ECEA50Z2R2
C504	ECEA1CS221
SPARK KILLER	
Z1 △	QCR0011
TRANSISTORS	
Q1	2SD2638S
Q2	2SB644R
Q3, 4	2SD2794P
Q101, 102	2SD2661T
Q103, 104	2SK230AO
Q105, 106	2SD661T
Q107, 108	2SB641R
Q109, 110	2SD592S
Q111, 112	2SC2021SF
Q113, 114	3DK30AO
Q115, 116	2SD661T
Q117, 118	2SB641R
Q301, 302	2SK68AM
Q303, 304	2SD661T
Q305, 306	2SK30AO
Q307, 308	2SD661T
Q309, 310	2SB641R
Q311, 312	2SD592S
Q313, 314	2SC2021SF1SF
Q315, 316	2SK30AO
Q317, 318	2SD661T
Q319, 320	2SB641R
Q501	2SB641R
Q502	2SC2021SF
DIODES & RECTIFIERS	
D1, 2	MA161
D3	MA1056
D4, 5, 6, 7, 8 △	SM112
D101, 102, 103, 104	RD24FB1
D105, 106, 107, 108	MA161
D301, 302, 303, 304	RD24FB1
D305, 306, 307, 308, 309	MA161
D501	MA1100
D502, 503	MA161
D504	SM112
D506	LD701GG
D507	LD701YY
D508	LD701UR
D509	TLR206
D515	MA161
INTEGRATED CIRCUITS	
IC101, 102	BA651
IC103, 104	BA652
IC105, 106	NJM4558D
IC107, 108	NJM4558DF
IC301, 302	BA651
IC303, 304	BA652
IC305, 306	NJM4558D
IC307, 308	NJM4558DF

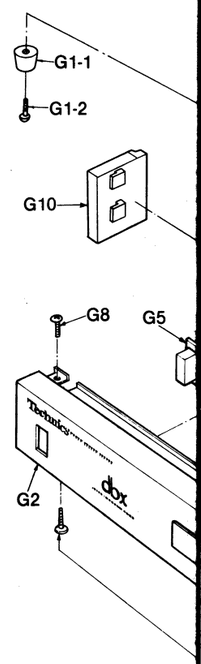
Ref No.	Part No.	Part Name & Description
TRANSFORMER		
T1 △	QLPD65iJE	AC Power Transformer
FUSES		
F1 △	XBAQ012534	Fuse (T 125mA)
F2 △	XBAQ008035	Fuse (T 80mA)
SWITCHES		
S1, 2, 3	QSWX310A	Switch
S4 △	QSW1117AS	Switch (Power ON/OFF)
S5 △	QSR1407	Switch (AC Power Voltage Select)
JACKS		
J1, 2, 3, 4, 5, 6, 7, 8	QEJ5027H	Jack Board

RP-9024 RP-9024

WIRING CONNECTION DIAGRAM





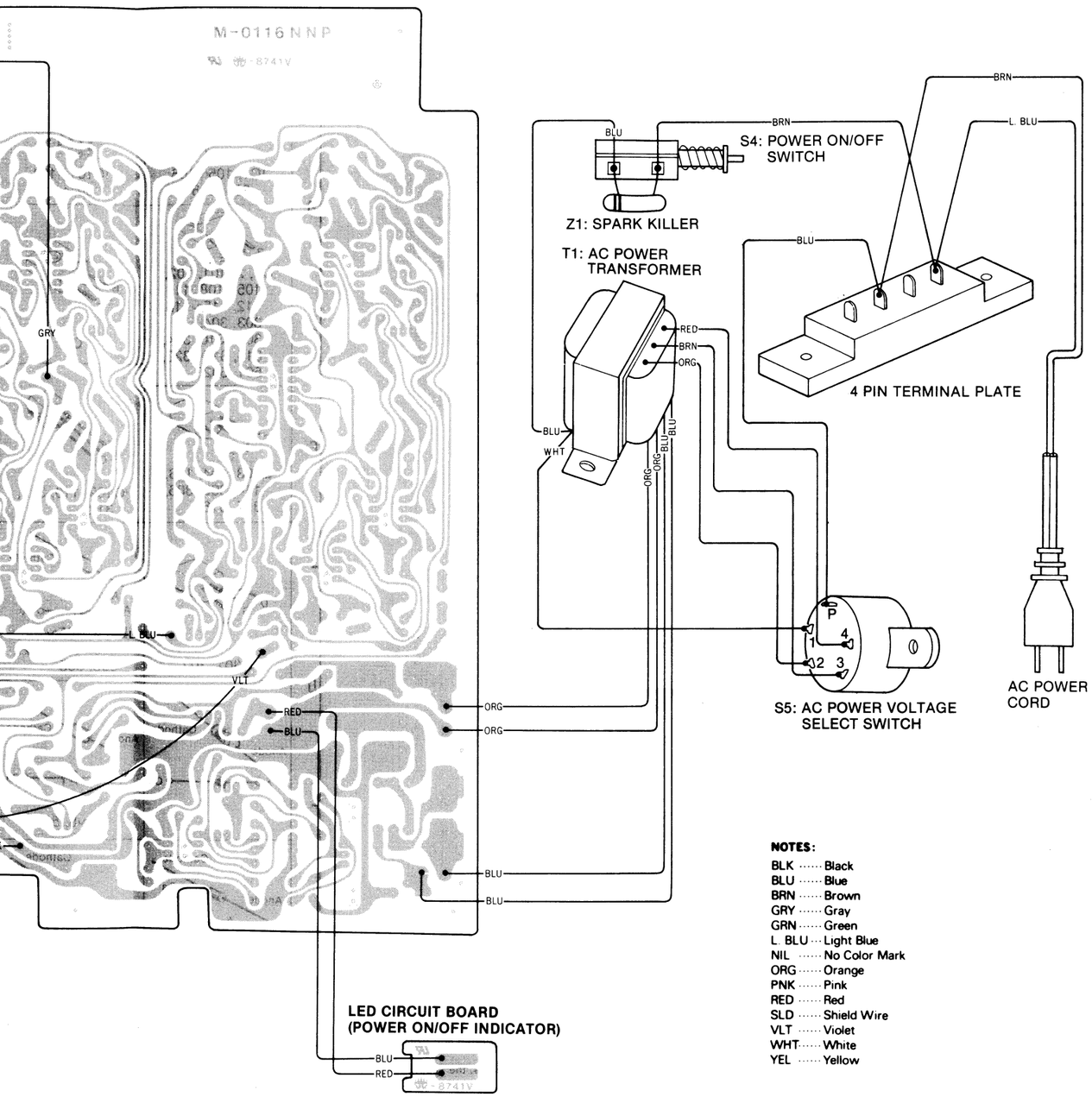


NOTES:

BLK	Black
BLU	Blue
BRN	Brown
GRY	Gray
GRN	Green
L. BLU	Light Blue
NIL	No Color Mark
ORG	Orange
PNK	Pink
RED	Red
SLD	Shield Wire
VLT	Violet
WHT	White
YEL	Yellow

REPL

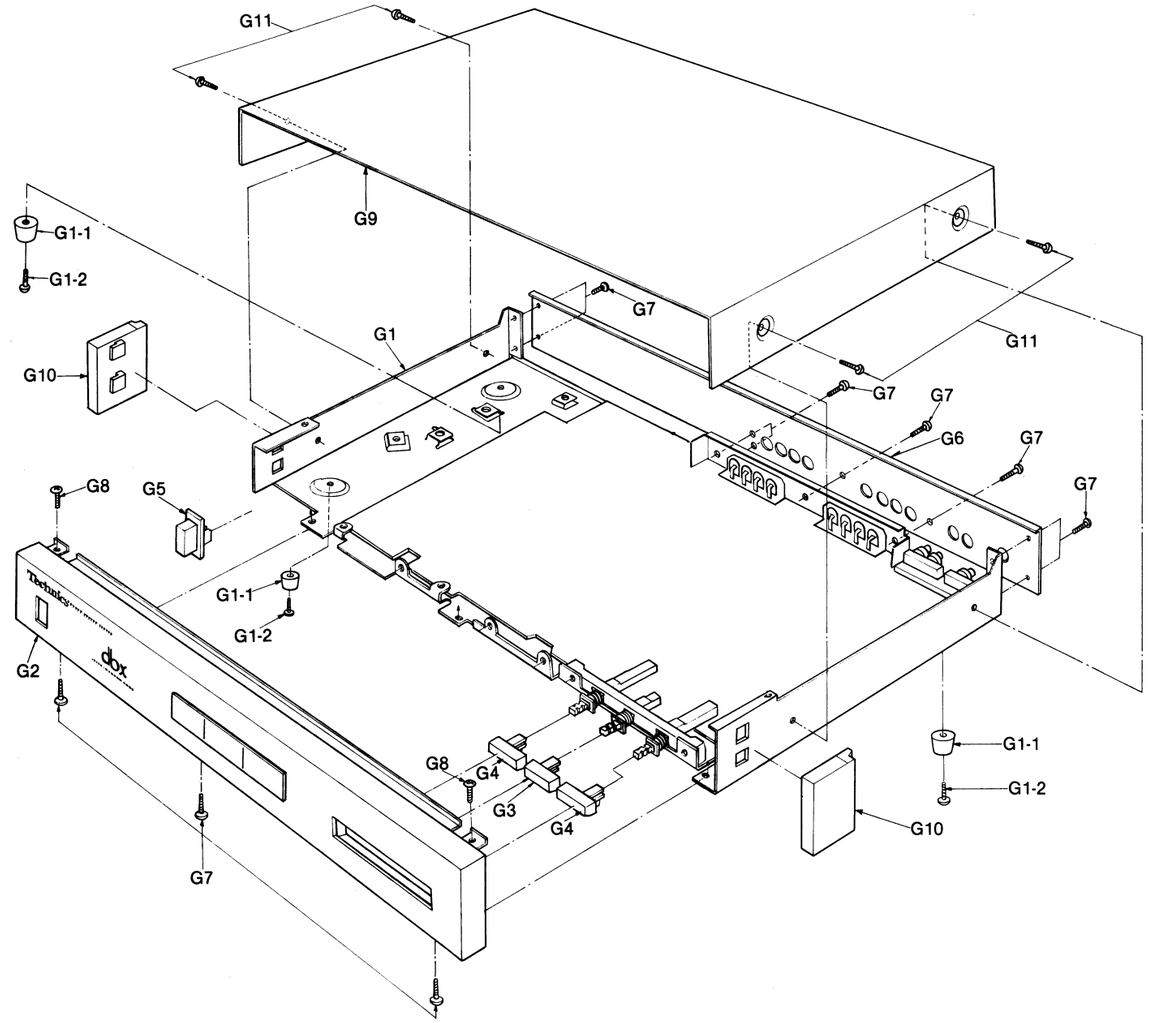
Ref
G1
G1-1
G1-2
G2
G3
G4
G5
G6
G7
G8
G9
G10



NOTES:

BLK ..... Black
BLU ..... Blue
BRN ..... Brown
GRY ..... Gray
GRN ..... Green
L. BLU ... Light Blue
NIL ..... No Color Mark
ORG ..... Orange
PNK ..... Pink
RED ..... Red
SLD ..... Shield Wire
VLT ..... Violet
WHT ..... White
YEL ..... Yellow

CABINET PARTS LOCATION



REPLACEMENT PARTS LIST

Ref No.	Part No.	Part Name & Description
	CABINET PARTS	
G1	QYMM0084	Bottom Cover Assembly
G1-1	QKA1083	Rubber Foot
G1-2	QHQ1313	Screw
G2	QYPM0052Y "Silver Type"	Front Panel Assembly
	QYOM0052K "Black Type"	Front Panel Assembly
G3	QGOM0064	Push Button (Bypass)
G4	QGOM0077	Push Button (Tape/dbx disc)
G5	WGOM0065	Push Button (Power ON/OFF)
G6	QGCM0052	Back Cover
G7	XTB3 + 8BFZ	Tapping Screw ⊕3×8
G8	XTS3 + 10B	Tapping Screw ⊕3×10
G9	QGCM0043 "Siver Type"	Case Cover
	QGCM0043K "Black Type"	Case Cover
G10	QGKM0152 "Silver Type"	Side Board
G10	QGKM0152K "Black Type"	Side Board
G11	XTB3 + 8BFN "Silver Type"	Tapping Screw ⊕3×8
	XTB3 + 8BFZ "Black Type"	Tapping Screw ⊕3×8
	ACCESSORIES	
A1	RP023A	Connection Cord
A2	QQT3158	Instruction Book
	PACKINGS	
P1	XZB15X20A05	Poly Sheet
P2	QPNM0179	Inside Carton
P3	QPAM0047	Cushion
P4	QPQ1052	Sheet
P5	QPG1985	Pad
P6	QPAM0050	Pad
P7	XZB40X60A02	Ploy Bag

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MESSUNGEN UND EINSTELL METHODEN

RP-9024 DEUTSCH

HINWEIS: Schalter und Regler in folgende Positionen stellen, wenn nicht anders angegeben:
- Bandtaste: ON.
- Plattenspielerpegelanzeiger: Mitte.
- Bandwiedergabepegelanzeiger: Mitte.
- Bandaufnahmepegelanzeiger: Mitte.

Gegenstand	Messung und Einstellung
Ⓐ **Voreinstellung**	Die halbbefestigten variablen Widerstände VR1, VR2 and VR3 (beziehungsweise für Plattenspielerpegelanzeiger, Bandwiedergabepegelanzeiger und Bandaufnahmepegelanzeiger) in die mittleren Positionen stellen, wie unter gezeigt. Fig. 2 Rückansicht der Anlage (direkt vertikal die Rille.) **Hinweis:** Machen Sie diese Einstellungen unbedingt zuerst.
Ⓑ **Einstellung des RMS-Anzeigers** Bedingung: * Bandbetriebsart Meßgeräte: * Röhrenvoltameter * AF-Oszillator * Dämpfungsglied * Oszilloskop * Widerstand (600Ω)	**Einstellung der Verkode** 1. Anschließen, wie in Fig. 3 gezeigt und die Bandtaste drücken. 2. Ein 50Hz, 300mV Signal von [LINE] IN eingeben. 3. Sich davon überzeugen, daß das Ausgangssignal bei TP9 (linker Kanal) und TP10 (rechter Kanal) (gezeigt in Fig. 1) auf einer 100Hz-Sinuswelle liegt. Wenn es keine Sinusform aufweist, wie in Fig. 4 gezeigt, VR105 (linker Kanal) und VR106 (rechter Kanal) einstellen, damit es sinusförmig wird. **Hinweis:** Die Spannung des Ausgangsignals nach der Einstellung beträgt ungerfähr 0,8 bis 1,3mVrms. **Einstellung der Entkode** 1. Anschließen, wie in Fig. 2 gezeigt und den Lärmreduktionswähler auf DISC. 2. Ein 50Hz, 400mV Signal von [TAPE DECK] WIEDERGABE eingeben. 3. Sich davon überzeugen, daß das Ausgangssignal bei TP19 (linker Kanal) und TP20 (rechter Kanal) (gezeigt in Fig. 1) auf einer 100Hz-Sinuswelle liegt. Falls es keine Sinusform aufweist, wie in Fig. 4 gezeigt, dies mit VR305 (linker Kanal) und VR306 (rechter Kanal) einstellen.
Ⓒ **Einstellung des dbx-Normalpegels** Bedingung: * Bandbetriebsart Meßgeräte * Röhrenvoltameter * AF-Oszillator * Dämpfungsglied * Oszilloskop * Widerstand (600Ω)	**Standardpegeleinstellung der Verkode** 1. Anschließen, wie in Fig. 5 gezeigt und 1kHz, 300mV Signal von [LINE] IN eingeben, die Bandtaste drücken. 2. Sich vergewissern, daß der Ausgangspegel bei [TAPE DECK] AUFNAHME innerhalb 300mV±1dB liegt. Wenn der Ausgangspegel nicht mit dem Standardwert übereinstimmt, dies mit VR107 (linker Kanal) und VR108 (rechter Kanal) einstellen. **Standardwert: 300mV±1dB** **Standardpegeleinstellung der dbx-Entkode** 1. Anschließen, wie in Fig. 5 gezeigt und ein 1kHz, 400mV-Signal von [TAPE DECK] WIEDERGABE eingeben und folgende Einstellungen vornehmen: 2. Sich vergewissern, daß der Ausgangspegel bei [LINE] OUT innerhalb 400mV±1dB liegt. Falls der Ausgangspegel nicht mit dem Standard übereinstimmt, dies mit VR307 (linker Kanal) und VR308 (rechter Kanal) (Fig. 1) regulieren. **Standardwert: 400mV±1dB**

Gegenstand	Messung und Einstellung
Ⓓ **Einstellung des Ausgangssignal-Verzerrfaktors** Bedingung: * Bandbetriebsart Meßgeräte: * Röhrenvoltameter * Dämpfungsglied * AF-Oszillator * Oszilloskop * Widerstand (600Ω) * Verzerrungsmesser	**Prüfen des Ausgangssignal- Verzerrfaktors der dbx Verkode** 1. Anschließen, wie in Fig. 6 gezeigt. 2. Bandtaste drücken. 3. Das Dämpfungsglied so einstellen, daß der Signalpegel bei [LINE] IN 300mV beträgt. 4. Den Verzerrfaktor des Ausgangssignals bei [TAPE DECK] AUFNAHME messen, sich vergewissern, daß der Verzerrfaktor kleiner als 0,15% ist. 5. Falls der Meßwert nicht dem Standard entspricht, folgendermaßen einstellen: **Standardwert: kleiner als 0,15%** **Verkodeneinstellung** 1. Anschließen, wie in Fig. 6 gezeigt und 1kHz, 300mV-Signal von [LINE] IN eingeben, folgende Einstellungen machen. 2. Bandtaste drücken und das Dämpfungsglied so einstellen, daß der Signalpegel bei [LINE] IN 300mV–3dB ergibt. 3. VR101 (linker Kanal) und VR102 (rechter Kanal) einstellen, so daß die Ausgangssignalverzerrung bei [TAPE DECK] AUFNAHME minimiert ist. 4. Das Dämpfungsglied einstellen, so daß der Signalpegel [LINE] IN 300mV + 2dB ergibt. 5. VR103 (linker Kanal) und VR104 (rechter Kanal) einstellen, so daß die Ausgangssignalverzerrung bei [TAPE DECK] AUFNAHME minimiert ist. 6. Diesen Vorgang 2 bis 5 mal wiederholen, bis der Verzerrfaktor möglichst klein ist. 7. Den Verzerrfaktor der dbx-Verkode prüfen. **Prüfen des ausgangssignalverzerrfaktors der dbx-Entkode** 1. Anschließen wie in Fig. 6, 1kHz, 400mV-Signal von [TAPE DECK] WIEDERGABE eingeben. Folgendermaßen prüfen: 2. Die Bandtaste drücken. 3. Den Verzerrfaktor des Ausgangssignals bei [LINE] OUT messen und sich überzeugen, daß es kleiner als 0,15% ist. 4. Falls der Meßwert nicht dem Standard entspricht, folgendermaßen einstellen: **Standardwert: kleiner als 0,15%** **Einstellung der Entkode** 1. Anschließen wie in Fig. 6 und 1kHz, 400mV (0dB)-Signal von [TAPE DECK] WIEDERGABE eingeben. Folgendermaßen einstellen: 2. Bandtaste drücken und das Dämpfungsglied einstellen, so daß der Signalpegel bei [TAPE DECK] WIEDERGABE 400mV–3dB ergibt. 3. VR301 (linker Kanal) und VR302 (rechter Kanal) einstellen, so daß die Ausgangssignalverzerrung bei [LINE] OUT möglichst klein ist. 4. Das Dämpfungsglied einstellen, so daß der Signalpegel bei [TAPE DECK] WIEDERGABE 400mV + 2dB ergibt. 5. VR303 (linker Kanal) und VR304 (rechter Kanal) einstellen, so daß die Ausgangssignalverzerrung bei [LINE] OUT minimiert ist. 6. Diesen vorgang 2 bis 5 mal wiederholen, bis der Verzerrfaktor möglichst gering ist. 7. Den Verzerrfaktor der dbx-Entkode prüfen.
Ⓔ **Betriebsüberprüfung**	• Die Ⓑ, Ⓒ and Ⓓ Messungen/Einstellungsergebnisse überprüfen und den dbx-Standardpegel und den Signalverzerrungsfaktor auf ihre Standardwerte einstellen.

Gegenstand
Ⓕ **Prüfen des Frequenzganges Verkodeaufteng (Entkodeeingang)**
Bedingung: * Bandbetriebsart
Meßgeräte * Röhrenvoltameter * Dämpfungsglied * AF-Oszillator * Oszilloskop * Widerstand (600Ω)

METHODEN

t anders angegeben:

nstellung
nde VR1, VR2 and VR3 elanzeiger, Bandwiederga- gelanzeiger) in die mittle- gt. ertikal die Rille.) ingt zuerst.
nd die Bandtaste drücken. IN eingeben. sgangssignal bei TP9 al) (gezeigt in Fig. 1) auf es keine Sinusform 5 (linker Kanal) und VR106 sinusförmig wird. h der Einstellung beträgt
nd den Lärmreduktionsw- DECK] WIEDERGABE sgangssignal bei TP19 al) (gezeigt in Fig. 1) auf s keine Sinusform mit VR305 (linker Kanal) .
nd 1kHz, 300mV Signal te drücken. spegel bei [TAPE DECK] liegt. Wenn der Ausgang- übereinstimmt, dies mit nter Kanal) einstellen.
ode nd ein 1kHz, 400mV-Signal geben und folgende spegel bei [LINE] OUT er Ausgangspegel nicht es mit VR307 (linker g. 1) regulieren.

Gegenstand	Messung und Einstellung
Ⓓ **Einstellung des Ausgangssignal-Verzerrfaktors** Bedingung: * Bandbetriebsart Meßgeräte: * Röhrenvoltameter * Dämpfungsglied * AF-Oszillator * Oszilloskop * Widerstand (600Ω) * Verzerrungsmesser	**Prüfen des Ausgangssignal- Verzerrfaktors der dbx Verkode** 1. Anschließen, wie in Fig. 6 gezeigt. 2. Bandtaste drücken. 3. Das Dämpfungsglied so einstellen, daß der Signalpegel bei [LINE] IN 300mV beträgt. 4. Den Verzerrfaktor des Ausgangssignals bei [TAPE DECK] AUFNAHME messen, sich vergewissern, daß der Verzerrfaktor kleiner als 0,15% ist. 5. Falls der Meßwert nicht dem Standard entspricht, folgendermaßen einstellen: **Standardwert: kleiner als 0,15%** **Verkodeneinstellung** 1. Anschließen, wie in Fig. 6 gezeigt und 1kHz, 300mV-Signal von [LINE] IN eingeben, folgende Einstellungen machen. 2. Bandtaste drücken und das Dämpfungsglied so einstellen, daß der Signalpegel bei [LINE] IN 300mV–3dB ergibt. 3. VR101 (linker Kanal) und VR102 (rechter Kanal) einstellen, so daß die Ausgangssignalverzerrung bei [TAPE DECK] AUFNAHME minimiert ist. 4. Das Dämpfungsglied einstellen, so daß der Signalpegel [LINE] IN 300mV + 2dB ergibt. 5. VR103 (linker Kanal) und VR104 (rechter Kanal) einstellen, so daß die Ausgangssignalverzerrung bei [TAPE DECK] AUFNAHME minimiert ist. 6. Diesen Vorgang 2 bis 5 mal wiederholen, bis der Verzerrfaktor möglichst klein ist. 7. Den Verzerrfaktor der dbx-Verkode prüfen. **Prüfen des ausgangssignalverzerrfaktors der dbx-Entkode** 1. Anschließen wie in Fig. 6, 1kHz, 400mV-Signal von [TAPE DECK] WIEDERGABE eingeben. Folgendermaßen prüfen: 2. Die Bandtaste drücken. 3. Den Verzerrfaktor des Ausgangssignals bei [LINE] OUT messen und sich überzeugen, daß es kleiner als 0,15% ist. 4. Falls der Meßwert nicht dem Standard entspricht, folgendermaßen einstellen: **Standardwert: kleiner als 0,15%** **Einstellung der Entkode** 1. Anschließen wie in Fig. 6 und 1kHz, 400mV (0dB)-Signal von [TAPE DECK] WIEDERGABE eingeben. Folgendermaßen einstellen: 2. Bandtaste drücken und das Dämpfungsglied einstellen, so daß der Signalpegel bei [TAPE DECK] WIEDERGABE 400mV–3dB ergibt. 3. VR301 (linker Kanal) und VR302 (rechter Kanal) einstellen, so daß die Ausgangssignalverzerrung bei [LINE] OUT möglichst klein ist. 4. Das Dämpfungsglied einstellen, so daß der Signalpegel bei [TAPE DECK] WIEDERGABE 400mV + 2dB ergibt. 5. VR303 (linker Kanal) und VR304 (rechter Kanal) einstellen, so daß die Ausgangssignalverzerrung bei [LINE] OUT minimiert ist. 6. Diesen vorgang 2 bis 5 mal wiederholen, bis der Verzerrfaktor möglichst gering ist. 7. Den Verzerrfaktor der dbx-Entkode prüfen.
Ⓔ **Betriebsüberprüfung**	• Die Ⓑ, Ⓒ and Ⓓ Messungen/Einstellungsergebnisse überprüfen und den dbx-Standardpegel und den Signalverzerrungsfaktor auf ihre Standardwerte einstellen.

Gegenstand	Messung und Einstellung
Ⓕ **Prüfen des Frequenzganges Verkodeaufteng mit (Entkodeeingang)** Bedingung: * Bandbetriebsart Meßgeräte * Röhrenvoltameter * Dämpfungsglied * AF-Oszillator * Oszilloskop * Widerstand (600Ω)	1. Anschließen wie in Fig. 7 und 1kHz, 400mV-Signal von [LINE] IN eingeben und folgendermaßen prüfen: 2. Mit dem Signalpegel 0dB bei [LINE] OUT, die Signalfrequenzen beispielsweise auf 100Hz, 20Hz, 1kHz und 15kHz. Die Signalpegel bei [LINE] OUT ablesen und überprüfen, ob sie den vorgeschriebenen Werten entsprechen. **Vorgeschriebene Werte** | Frequenz | Signalpegel bei [LINE] OUT | |---|---| | 1kHz | 0dB | | 100Hz | 0dB±1B | | 20Hz | –9dB±3dB | | 15kHz | 1,5dB±1,5dB |

METHODES DES MEASURES ET REGLAGES

RP-9024 FRANCIAS

NOTA: Positionner les commuteurs à levier et les commandes dans les positions suivantes, sauf indication contraire.
- Interrupteur de bande: ON (marche).
- Réglage du niveau de lecture de disque: Centre.
- Réglage du niveau de lecture de bande: Centre.
- Réglage du niveau d'enregistrement de bande: Centre.

SECTION	MESURES ET REGLAGES
Ⓐ **Préréglage**	Placer les résistances variables semi-fixes VR1, VR2 et VR3 (respectivement pour le réglage du niveau de lecture de disque, le réglage du niveau de lecture de bande et le réglage du niveau d'enregistrement de bande) à leur position central, comme indiqué ci-dessous. Fig. 2 Vue arrière de l'unité (gorges dirigées verticalement). **Remarque:** Veiller à bien effectuer en premier lieu ce réglage.
Ⓑ **Réglage du détecteur RMS** Condition: * Mode de bande Equipement: * Voltmètre électronique * Générateur AF * Atténuateur * Oscilloscope * Résistance (600Ω)	**Réglage du côté Encode** 1. Faire les branchements comme indiqué dans la fig. 3, et appuyer sur le bouton de bande. 2. Appliquer un signal de 50Hz, 300mV à partir de la borne [LINE] IN. 3. S'assurer que le signal de sortie à TP9 (canal gauche) et TP10 (canal droit) (indiqué dans la fig. 1) forme une onde sinusoïdale à 100Hz. Si le signal de sortie n'est pas sinusoïdal, comme indiqué dans la fig. 4, régler VR105 (canal gauche) et VR106 (canal droit) afin de le rendre sinusoïdal. **Remarque:** Le voltage du signal de sortie après réglage est approximativement de 0,8 à 1,3mVrms. **Réglage du côté Decode** 1. Effectuer les branchements comme indiqué dans la fig. 2 et placer le sélecteur de réduction de bruit sur la position disque. 2. Appliquer un signal de 50Hz, 400mV à partir de la borne PLAY [TAPE DECK]. 3. S'assurer que le signal de sortie à TP19 (canal gauche) et TP20 (canal droit) (voir fig. 1) forme une onde sinusoïdale à 100Hz. Si le signal de sortie n'est pas sinusoïdal, comme indiqué dans la fig. 4, régler VR305 (canal gauche) et VR306 (canal droit) pour le rendre sinusoïdal.
Ⓒ **Réglage du niveau standard dbx** Condition: * Mode de bande Equipement: * Voltmètre électronique * Générateur AF * Atténuateur * Oscilloscope * Résistance (600Ω)	**Réglage du niveau standard du côté Encode dbx** 1. Effectuer les branchements comme indiqué dans la fig. 5 et appliquer un signal de 1kHz, 300mV à partir de la borne [LINE] IN; pousser le bouton de bande. 2. S'assur que le niveau de sortie à la borne REC [TAPE DECK] soit de 300mV±1dB. Si le niveau de sortie ne correspond pas à cette valeur standard, régler VR107 (canal gauche) et VR108 (canal droit) pour qu'il soit ramené à cette valeur. **Valeur standard: 300mV±1dB** **Réglage du niveau standard du côté Decode** 1. Effectuer les branchements comme indiqué dans la fig. 5 et appliquer un signal de 1kHz, 400mV à partir de la borne PLAY [TAPE DECK]; effectuer ensuite les réglages suivants.

SECTION	MESURES ET REGLAGES
	2. S'assurer que le niveau de sortie à la borne [LINE] OUT soit de 400mV±1dB. S'il ne correspond pas à cette valeur standard, régler VR307 (canal gauche) et VR308 (canal droit) pour le ramener à cette valeur. **Valeur standard: 400mV±1dB**
Ⓓ **Réglage du facteur de distorsion du signal de sortie** Condition: * Mode de bande Equipement: * Voltmètre électronique * Atténuateur * Générateur AF * Oscilloscope * Résistance (600Ω) * Appareil de mesure de la distorsion	**Vérification du facteur de distorsion du signal de sortie du côté Encode dbx** 1. Effectuer les branchements comme indiqué dans la fig. 6. 2. Appuyer sur le bouton de bande. 3. Régler l'atténuateur de sorte que le niveau du signal à la borne [LINE] IN soit de 300mV. 4. Mesurer le facteur de distorsion du signal de sortie à la borne REC [TAPE DECK], et s'assurer que sa valeur soit de moins de 0,15%. 5. Si la valeur mesurée ne correspond pas à la valeur standard, régler comme ci-après: **Valeur standard: Moins de 0,15%** **Réglage du côté Encode** 1. Effectuer les branchements comme indiqué dans la fig. 6 et appliquer un signal de 1kHz, 300mV á partir de la borne [LINE] IN; effectuer ensuite les réglages suivants. 2. Appuyer sur le bouton de bande et régler l'atténuateur de sorte que le niveau de signal à la borne [LINE] IN devienne 300mV−3dB. 3. Régler VR101 (canal gauche) et VR102 (canal droit) de sorte que la distorsion du signal de sortie à la borne REC [TAPE DECK] soit minimisée. 4. Régler l'atténuateur de sorte que le niveau du signal à la borne [LINE] IN soit de 300mV + 2dB. 5. Régler VR103 (canal gauche) et VR104 (canal droit) de sorte que la distorsion du signal de sortie à la borne REC [TAPE DECK] soit minimisée. 6. Répéter les réglages des étapes 2 à 5 jusqu'à ce que le facteur de distorsion soit minimisé. 7. Vérifier la valeur du facteur de distorsion du côté Encode dbx. **Vérification du facteur de distorsion du signal de sortie du côté Decode dbx** 1. Effectuer les branchements comme indiqué dans la fig. 6 et appliquer un signal de 1kHz, 400mV à partir de la borne PLAY [TAPE DECK]; effectuer les opérations suivantes. 2. Appuyer sur le bouton de bande. 3. Mesurer le facteur de distorsion du signal de sortie à la borne [LINE] OUT, et s'assurer que sa valeur soit de moins de 0,15%. 4. Si la valeur mesurée ne correspond pas à la valeur standard, procéder aux réglages ci-après. **Valeur standard: Moins de 0,15%** **Réglage du côté Decode** 1. Effectuer les branchements comme indiqué dans la fig. 6 et appliquer un signal de 1kHz, 400mV (0dB) à partir de la borne PLAY [TAPE DECK]; effectuer les réglages suivants. 2. Appuyer sur le bouton de bande, et régler l'atténuateur de sorte que le niveau du signal à la borne PLAY [TAPE DECK] soit de 400mV−3dB. 3. Régler VR301 (canal gauche) et VR302 (canal droit) de sorte que la distorsion du signal de sortie à la borne [LINE] OUT soit minimisée. 4. Régler l'atténuateur de sorte que le niveau du signal à la borne PLAY [TAPE DECK] soit de 400mV + 2dB.

SECTION
Ⓔ **Vérification de fonctio**
Ⓕ **Vérification de la réponse de fréquence (Arrière à arrière)** Condition: * Mode de bande Equipement: * Voltmètre électronique * Atténuateur * Générateur AF * Oscilloscope * Résistance (600Ω)

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SECTION	MESURES ET REGLAGES
	2. S'assurer que le niveau de sortie à la borne [LINE] OUT soit de 400mV±1dB. S'il ne correspond pas à cette valeur standard, régler VR307 (canal gauche) et VR308 (canal droit) pour le ramener à cette valeur. **Valeur standard: 400mV±1dB**
Ⓓ Réglage du facteur de distorsion du signal de sortie Condition: * Mode de bande Equipement: * Voltmètre électronique * Atténuateur * Générateur AF * Oscilloscope * Résistance (600Ω) * Appareil de mesure de la distorsion	**Vérification du facteur de distorsion du signal de sortie du côté Encode dbx** 1. Effectuer les branchements comme indiqué dans la fig. 6. 2. Appuyer sur le bouton de bande. 3. Régler l'atténuateur de sorte que le niveau du signal à la borne [LINE] IN soit de 300mV. 4. Mesurer le facteur de distorsion du signal de sortie à la borne REC [TAPE DECK], et s'assurer que sa valeur soit de moins de 0,15%. 5. Si la valeur mesurée ne correspond pas à la valeur standard, régler comme ci-après: **Valeur standard: Moins de 0,15%** **Réglage du côté Encode** 1. Effectuer les branchements comme indiqué dans la fig. 6 et appliquer un signal de 1kHz, 300mV á partir de la borne [LINE] IN; effectuer ensuite les réglages suivants. 2. Appuyer sur le bouton de bande et régler l'atténuateur de sorte que le niveau de signal à la borne [LINE] IN devienne 300mV–3dB. 3. Régler VR101 (canal gauche) et VR102 (canal droit) de sorte que la distorsion du signal de sortie à la borne REC [TAPE DECK] soit minimisée. 4. Régler l'atténuateur de sorte que le niveau du signal à la borne [LINE] IN soit de 300mV + 2dB. 5. Régler VR103 (canal gauche) et VR104 (canal droit) de sorte que la distorsion du signal de sortie à la borne REC [TAPE DECK] soit minimisée. 6. Répéter les réglages des étapes 2 à 5 jusqu'à ce que le facteur de distorsion soit minimisé. 7. Vérifier la valeur du facteur de distorsion du côté Encode dbx. **Vérification du facteur de distorsion du signal de sortie du côté Decode dbx** 1. Effectuer les branchements comme indiqué dans la fig. 6 et appliquer un signal de 1kHz, 400mV à partir de la borne PLAY [TAPE DECK]; effectuer les opérations suivantes. 2. Appuyer sur le bouton de bande. 3. Mesurer le facteur de distorsion du signal de sortie à la borne [LINE] OUT, et s'assurer que sa valeur soit de moins de 0,15%. 4. Si la valeur mesurée ne correspond pas à la valeur standard, procéder aux réglages ci-après. **Valeur standard: Moins de 0,15%** **Réglage du côté Decode** 1. Effectuer les branchements comme indiqué dans la fig. 6 et appliquer un signal de 1kHz, 400mV (0dB) à partir de la borne PLAY [TAPE DECK]; effectuer les réglages suivants. 2. Appuyer sur le bouton de bande, et régler l'atténuateur de sorte que le niveau du signal à la borne PLAY [TAPE DECK] soit de 400mV–3dB. 3. Régler VR301 (canal gauche) et VR302 (canal droit) de sorte que la distorsion du signal de sortie à la borne [LINE] OUT soit minimisée. 4. Régler l'atténuateur de sorte que le niveau du signal à la borne PLAY [TAPE DECK] soit de 400mV + 2dB.

SECTION	MESURES ET REGLAGES
	5. Régler VR303 (canal gauche) et VR304 (canal droit) de sorte que la distorsion du signal de sortie à la borne [LINE] OUT soit minimisée. 6. Répéter les étapes de 2 à 5 jusqu'à ce que le facteur de distorsion soit minimisé. 7. Vérifier le facteur de distorsion du côté Decode dbx.
Ⓔ Vérification de fonction	• Vérifier à nouveau les résultats de mesures et de réglages des sections Ⓑ, Ⓒ et Ⓓ, et régler le niveau standard dbx ainsi que le facteur de distorsion du signal à leur valeur standard.
Ⓕ Vérification de la réponse de fréquence (Arrière à arrière) Condition: * Mode de bande Equipement: * Voltmètre électronique * Atténuateur * Générateur AF * Oscilloscope * Résistance (600Ω)	1. Effectuer les branchements comme indiqué dans la fig. 7 et appliquer un signal de 1kHz, 400mV à partir de la borne [LINE] IN. Procéder aux opérations suivantes: 2. Avec un niveau de signal à la borne [LINE] OUT d'une valeur de 0dB, changer la fréquence du signal sur 100Hz, 20Hz, et 15kHz respectivement. Lire les niveaux de signal à la borne [LINE] OUT et vérifier qu'ils correspondent aux spécifications indiquées ci-dessous. **Spécifications** Fréquence / Niveaux de signal à [LINE] OUT 1kHz / 0dB 100Hz / 0dB±1B 20Hz / –9dB±3dB 15kHz / 1,5dB±1,5dB